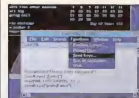


**MapInfo** for DOS 5.0 allows users to display maps with one keystroke ..... **13**



**The Kris Master** 20-MHz 386SX notebook weighs 6.9 pounds, including battery ..... **31**



**Extra for Windows** automates mainframe connections with a powerful macro generator ..... **43**

## NEWS

Novell reorganizes its sales force and prepares to hand off some national accounts to IBM ..... **5**

IBM reduces prices on certain PS/2 models that are slated for replacement ..... **5**

Spreadsheet vendors wage a war of words at Comdex ..... **5**

The Bush administration advocates auctioning off spread-spectrum broadcasting rights ..... **8**

Infralink Datentechnik unveils an infrared wireless connector for peripherals at Comdex ..... **8**

Lotus 1-2-3 for Windows wins praise but will ship later than expected ..... **8**

Ungermann-Bass introduces the NetDirector Topological Map for managing networks ..... **8**

Apple announces it will trim its work force by 10 percent over the next year ..... **8**

Microsoft plans a research division for voice recognition and natural language commands ..... **8**

HP plans to position NewWave as the operating environment of the future ..... **113**

Bill Gates predicts a rosy future for Microsoft's Visual Basic ..... **113**

## SOFTWARE

Word processor publishers are adding pop-up E-mail links to their packages, capitalizing on the growth of networking ..... **13**

MapInfo for DOS 5.0 has more data manipulation options and an improved interface ..... **13**

## PROGRAMMING

Third-party developers announce supporting applications for Microsoft's Visual Basic ..... **20**

## HARDWARE

Ergon debuts a graphics accelerator board for Windows ..... **31**

## NETWORKING

Extra for Windows micro-to-mainframe software improves support for DDE and generates macros ..... **43**

## MACINTOSH NEWS

Vendors address the single-slot problem of the SE/30 and IIsi with "piggyback adapters" ..... **60**

## INFO WORLD

## INDUSTRY

Computer retailers band together to combat allegations that they are overpriced and provide inadequate service ..... **82**

## PERSPECTIVES

Color printing is finally coming down to the price range of business users. Several technologies and price schemes are available ..... **58**

## PRODUCT COMPARISON

In the second of two parts, we look at nine 33-MHz 386 PCs from a wide range of vendors ..... **71**

## IMPRESSIONS

Grammatik for Windows 2.0 shapes up your writing ..... **86**

Nanao 9080i multiscanning monitor is a 16-inch beauty that makes the most of Windows ..... **87**

## BUYER'S ADVISORY

A 10-byte program will set the time in your AUTOEXEC.BAT file ..... **88**

## REVIEWS

On Target for Windows, project management software ..... **89**

DR DOS, Version 5.0 ..... **91**

IBM PS/2 Model 90, 486SX PC ..... **93**

Review Responses ..... **94**

## COLUMNS

Tech Talk: Steve Gibson ..... **42**

Tech Street: John Gantz ..... **53**

## NEXT WEEK

**PRODUCT COMPARISON.** Seven personal information managers stress various functions to suit the unique needs of the people who use them.

**REVIEWS.** Borland's Turbo Pascal for Windows; Gold Disk's Animation Works for Macintosh; HP's LaserJet IIISi network printer.

**PERSPECTIVES.** The "look" of a product has become a crucial element of success, as current trends in industrial design illustrate.

**State of the Industry:** Rachel Parker ..... **53**

**From the Editor** ..... **64**

**To the Editor** ..... **64**

**Future Tense:** Paul Saffo ..... **66**

**First Look/ Harvard Graphics 3.0:** Michael J. Miller ..... **88**

**Resources** ..... **88**

**Also's Fables:** Stewart Alsop ..... **114**

**Notes From the Field:** Robert X. Cringley ..... **114**

**INFOMARKET** ..... **66**

## AT DEADLINE

# Apple Says Microsoft Lied To Get '85 Licensing Pact

Microsoft Corp. used lies and threats to force Apple Computer Inc. to sign a 1985 licensing agreement key to the development of Windows, Apple told a federal judge last week. Apple filed a motion to expand its 1988 complaint against Microsoft and Hewlett-Packard, asking that its 1985 licensing agreement with Microsoft be declared invalid, a move a Microsoft attorney described as "desperate." U.S. District Judge Vaughn set a hearing on the motion for June 14.

—Tom Quinlan

## NewWave ToolBook Due by 1992

Asymetrix will ship a version of ToolBook by year end that will let users build NewWave applications, said Shelly Julien, product manager of the Bellevue, Washington, company. The program will not completely support Hewlett-Packard NewWave but will let users record Agent tasks that include ToolBook applications, and vice versa. The NewWave version will also let users start ToolBook applications by using the "drag-and-drop" metaphor, Julien said. The company also plans tools for building database applications that have automatic forms generation, said CEO Paul Allen.

—Stuart J. Johnston

## SPA to Judge Multimedia Machines

The Microsoft-led Multimedia PC Council — a consortium of 11 computer hardware vendors — has selected the Software Publishing Association to determine which hardware and software meets Microsoft's base-level multimedia specification, said sources close to Microsoft. Originally Microsoft intended to judge MPC compatibility itself, but software developer outcry against the plan caused the Redmond, Washington, software giant to reconsider that decision.

—Nico Krohn

## Notebook PCs to Get Infrared Link

Photonics Corp. has introduced a portable version of its infrared Photolink product that will be integrated into notebook and pen-based PCs. Several manufacturers have already signed up for the product, which is scheduled to ship early next year, said Gary Hughes, CEO of Photonics. The Campbell, California-based networking company is also developing repeaters, repeater bridges, and add-on units for desktop systems to support the notebook systems.

—Louise Fickel

## Motorola Slashes Wireless LAN Price

Motorola Corp. of Arlington Heights, Illinois, has slashed the price of its Altair wireless Ethernet by \$3,495 to \$995. A basic Altair installation, including a user module and \$3,995 control module, now costs \$4,990, down from \$7,490. A fully configured 30-user system now sells for \$299 per user, compared to \$715 per user before the cut.

—David Courtney

## Northshore Ships 40-Mbps Adapter

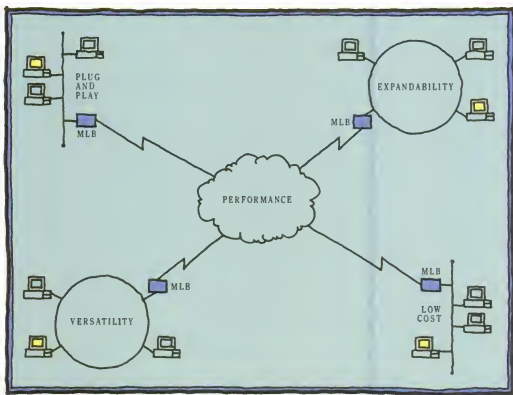
Northshore Systems Inc. is shipping an \$899 token ring adapter that company officials say can reach speeds up to 40 megabits per second. The TaxILAN can operate over either shielded twisted-pair or fiber-optic cabling. Any 33-MHz 386 PC can accommodate the higher speeds, officials said. The TaxILAN includes drivers for NetWare 2.x; a driver for NetWare 3.x will be available by the end of June.

—Louise Fickel

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## IBM's Second Round of Price Cuts

Model	New Price	Old Price	Percent*
<b>Model 30 266 E21</b> 1MB RAM, 20MB hard drive	\$1,795	\$2,145	16
<b>Model 30 286 E41</b> 1MB RAM, 45MB hard drive	\$2,345	\$2,495	6
<b>Model 55 5X 031</b> 2MB RAM, 30MB hard drive	\$2,795	\$2,995	12
<b>Model 55 5X 061</b> 2MB RAM, 60MB hard drive	\$2,945	\$3,295	11
<b>Model 55 L5 LEO</b> 2MB RAM, Ethernet adapter No floppy or hard disks	\$2,395	\$2,795	13
<b>Model 80 366 081</b> 4MB RAM, 80MB hard disk	\$4,595	\$5,495	16
<b>Model 80 366 A16</b> 4MB RAM, 160MB hard disk	\$7,095	\$8,695	16
<b>Model 80 366 A31</b> 4MB RAM, 320MB hard disk	\$8,695	\$11,495	24

\*PERCENTAGES HAVE BEEN ROUNDED OFF

SOURCE: IBM

## IBM Slashes Prices for Second Time This Month

Affected Products Are Slated for Replacement

BY DAVID COURSEY

For the second time in less than a month, IBM Corp. has lowered prices on selected members of its PS/2 line, cutting 6 to 24 percent off the cost of some of its most popular models.

However, these reductions are less significant than they may appear, analysts said.

"Unlike Compaq, which cut prices across the board, IBM is cutting prices on products which are slated for replacement early this summer," said Brian Clarke, PC pricing analyst at International Data Corp., in Framingham, Massachusetts.

"They are taking the cuts early instead of waiting for the announcement of the new products," Clarke added.

IBM's most recent price cuts cover the 286-based Model 30s, 16-MHz 386SX Model 55s, and 386-based Model 80s running at 20 and 25 MHz.

Last month, Compaq cut prices in reaction to slack demand and to narrow the wide gap between list and street prices. (See "Compaq Cuts Prices to Sift Competition," April 22, Page 5.)

IBM's cuts, on the other hand, appear to be only a slight deviation from Big Blue's traditional business plan.

IBM often cuts prices on systems it plans to discontinue, but usually waits until new models have been announced. The timing of the latest cuts might have been influenced by

intense competition in the current economy, analysts said.

Compaq's and IBM's price cuts have prompted other vendors to re-evaluate their pricing strategies. Last week, Zenith Data Systems made major pricing cuts.

Zenith's price cuts ranged from 12 to nearly 31 percent, cutting between \$350 and \$3,000 off the prices of its current portable and desktop systems.

The most drastic price reductions included \$3,000 lopped off the list price of the Z-386/33E Model 150 and a \$2,600 reduction in the suggested price of the Model 320.

In its laptop category, ZDS dropped prices on its SlimPort 286 by \$1,100 to \$2,899 and cut pricing on its SupersPort 386SX Model 120 by \$800 to \$5,199.

According to Zenith, the price cuts were designed to make room for five new systems introduced at Comdex.

Last month, Toshiba cut its pricing dramatically, while AST Research and ALR made minor changes.

Northgate and CompaqAdd have yet to cut prices, while Dell Computer cut about 10 percent off select models.

Still, Clarke believes more pricing adjustments are coming. "Many companies haven't followed suit to realign their prices in relation to Compaq, but I believe they will. It isn't something that can wait," Clarke said.

## IBM Gets Toehold Into Novell Sales

Novell Reorganizes Sales Structure, Giving IBM Access to Accounts

BY JODI MARDESICH

Novell Inc. has revamped its sales organization, paving the way for IBM to take over some large national accounts, just two months after IBM started selling NetWare in a blue box.

The sales restructuring has affected about 50 people, with 20 of them laid off. The figure was less than 2 percent of the company's work force, said Jim Bills, vice president of the Provo, Utah firm. Some executives were shuffled, including Michael Passaro, formerly in charge of the national accounts program. He is now vice president of international sales.

Novell reorganized its sales organization to take advantage of the strength of IBM's large sales force, according to Bills. "We have as many major account reps, but they can now serve more accounts by leveraging IBM as a partner," Bills said.

Analysts are also confident that IBM can give customers better service and support. "Part of that [reorganization] has to do with redirecting corporate accounts to IBM," said Frank Drubeck, president of Commu-

nications Network Architects, in Washington. "IBM has got thousands of salesmen and a gigantic support organization. It also gives Novell a chance to unload a bunch of sales and support needs that are unproductive to them, in the sense it's an expense," he said.

IBM is responding aggressively, ramping up its presence in the channel. "A lot, if not most, Novell accounts also have IBM equipment; therefore, IBM has been covering them," said David E. Nichols, director of channel management, connectivity, for IBM. "Whether and how Novell covers them is up to them; we're covering them in the way we want to," he added.

"Novell can't compete with IBM on a head-to-head basis either in terms of geographic reach or people reach," said Alice Bradie, principal/communications technologies with Hambrecht & Quist Inc., in New York. "To take away confusion, they're handing off certain of those key accounts to IBM," she said.

However, not all users are happy about the prospect of working directly with IBM. "I'd

prefer that Novell keep representing us directly," said Ken Mosher, telecommunications consultant with Aetna Life and Casualty, in Hartford, Connecticut. "We get good support. We have such a longstanding relationship with Novell [as a national account] that I don't see the need for IBM to move in."

IBM is gearing up to be a big player in the networking market. The company's initial orders for NetWare came to \$17 million in Novell's second quarter, which ended last month. Those orders stocked two U.S. distribution centers—the deal calls for IBM to stock eight distribution centers in the United States as well as in international centers, Bills said.

IBM is exerting pressure on its large corporate customers to buy NetWare from them, according to NetWare resellers. "IBM is playing a bit of hardball," said one. IBM is also offering the product at a lower price than Novell, said NetWare resellers. "It hasn't affected us yet, but it's clearly happening," said Mike Gansl, president of NetLAN, a platinum reseller in New York.

## Spreadsheet Rivals Lotus And Borland Spar at Comdex

BY THE INFOWORLD STAFF

ATLANTA — Spreadsheet rivals Borland International Inc. and Lotus Development Corp. proved at Windows World last week they still have the right formula for conflict. Every time they met, the insults multiplied.

As 1-2-3 for Windows took its debut bows, Borland officials claimed their upcoming Quattro Pro for Windows will surpass whatever Lotus brings to mar-

ket.

"So, [Quattro Pro for Windows] is the product that will leapfrog us. Will it also have a 1-2-3 interface?" asked Don Casey, vice president of Lotus' spreadsheet division. Lotus has sued Borland for copyright infringement of the 1-2-3 interface.

Steve Kahn, vice president and general manager of Borland's spreadsheet business, would not comment on that, but he assured Casey that it wouldn't feature the "icon abuse" found in 1-2-3 for Windows. "They have 70 icons. You have to hit a button to get words explaining what the pictures were all about," Kahn said.

Later, Frank King, senior vice president of Lotus software business group, criticized Quattro Pro 3.01, a maintenance upgrade for the recently shipped spreadsheet.

To that, Kahn had this to say: "Boy, you guys should talk about upgrades. 1-2-3 is the Kleenex of spreadsheets," saying buyers can use it only once before a new version ships. Critics maintain that Lotus of-



Borland's Steve Kahn said Lotus' 1-2-3 for Windows suffers from "icon abuse."

fers too many versions and upgrades to its product line.

Attendees seemed to enjoy the banter, although some felt that low blows such as these can cloud real issues for buyers. "It's the old FUD [fear, uncertainty, and doubt], which can cause people to defer their buying decisions," said John S. Tarbox, a New Castle, Delaware-based consultant.

Meanwhile, Microsoft was out of the fray — at least momentarily. "We'll be happy to let these DOS guys slug it out — we'll concentrate on GUI product," said Pete Higgins, general manager of Microsoft's analysis business unit.



Microsoft's Pete Higgins watched as Borland and Lotus officials hurled insults.

# Spread Spectrum Technology May Go on the Auction Block

BY LOUISE FICKEL

The Bush administration wants the wireless technology industry to put its money where its mouth is.

To spread this message, a federal employee told attendees at a wireless communications symposium, in Palo Alto, California, last week that they may soon have to buy spread spectrum instead

of acquiring it through a lottery.

Auctioning spectrum will guarantee that "it get to the user very quickly instead of in a lottery where the license lands in the hands of someone who doesn't intend to use it and [instead] creates the market himself," said Janice Obuchowski, assistant secretary for communications and information in the U.S. Department of Commerce.

Spread spectrum refers to a method of spreading the signal among many frequencies that manufacturers of wireless technologies, such as cellular phones, wireless LANs, and pagers, use for transmitting voice and data.

Sen. Ted Stevens of Alaska, will introduce a bill proposing that the Federal Communications Commission (FCC) auction off 200 MHz of spread

spectrum, which is currently being used by the federal government. Rep. Don Ritter of Pennsylvania, introduced similar legislation last March.

Bills introduced by Sen. Daniel Inouye of Hawaii, and Rep. John Dingell of Michigan, also propose to turn the spectrum over to commercial users, but do not recommend auctioning it.

President Bush has said he will veto any bill that doesn't include auctioning the spectrum.

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## Infralink Beats Toshiba With Debut of Infrared Connectivity Device

BY MARK BROWNSTEIN

A German company introduced an infrared product for connecting PCs to peripherals at Spring Commex, beating to market better known manufacturers such as Toshiba.

The Infralink from Infralink, Datentechnik GmbH provides an infrared connection between printers, plotting devices, and computers via the parallel port.

The product can transmit data at 40 kilobits per second. A full duplex connection between transmitting and receiving devices provides error-free connection. Error correction built into the unit further improves reliability.

Toshiba is demonstrating a similar technology, but it has not indicated when products will be commercially available. Infralink Datentechnik, however, does not have a U.S. distributor.

Infralink can connect devices from as far as 210 feet. The company suggests the devices be pointed at the ceiling.

Infralink can control as many as eight devices. Each peripheral is identified with a unique channel number. Pressing the number of the appropriate peripheral automatically routes the transmission.

If more than one computer wants to print to a printer, automatic queuing will make the second computer wait until the first print job is completed.

The Infralink is expected to sell in the United States for about \$499 per unit, and Infralink Datentechnik expects to find a U.S. distributor this year.

Infralink Datentechnik GmbH, Am Fuchsberg 8, D-4040 Neuss 1, Germany, 0 2101-3 50 53.

### Advertisement

Which UNIX RDBMS did Hewlett-Packard, IBM, Unisys, Data General, AT&T, Sun, and Sequent choose to demonstrate the power of their latest UNIX systems?

Informix

See page 9.

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## 1-2-3/W Enthusiasts Will Have to Wait

Beta Tests Show Program Needs to Address Some Major Problems

BY BARBARA DARROW

ATLANTA — Lotus Development Corp. dominated Windows World here last week with an early version of 1-2-3 for Windows. But given the state of the current beta, 1-2-3/W may meet its summer ship date later rather than sooner.

Viewers praised 1-2-3/W's features — especially its compatibility with current versions of 1-2-3, an important feature to Lotus' 14 million users. "That

will make it much easier for me to persuade current 1-2-3 users to move over," said Jeff Smith, microsystems specialist for Good Samaritan Hospital, in Cincinnati.

Those users may not move as early as some had hoped. "Lotus tends to ship real betas that still have major problems," said one tester. "So far, this product crashes a lot, has lots of UAEs [Unrecoverable Application Errors] — more than I see in any Windows app."

Another tester said a more stable beta is expected within 30 days.

Microsoft officials contend they are eager for the competition Lotus will provide for Excel 3.0.

"Delays in 1-2-3/W and Quattro Pro for Windows are a disadvantage, because people want to look at them before they buy," said Pete Higgins, general manager of Microsoft's Analysis Business Unit.

"Competitive issues won't be things like icons and tool bars, but how easy it makes it for users to try things out, and we have an advantage there," Higgins said.

Another beta tester, however, did criticize what he termed 1-2-3/W's "icon overkill." The package ships with 20 customizable icon choices. "You can't even tell what these things represent," the tester said. "They should get an artist who understands the concept of icons."

Microsoft's market share will fall, but volume shipments will rise as the proliferation of Windows applications legitimizes the GUI, according to Mike Maples, vice president of applications at Microsoft.

"I think 1-2-3 will give Excel a run for its money and Excel [3.0] will stall," said Will Fastie, editor of *The Fastie Report*, in Baltimore, Maryland.

Most 1-2-3 erosion thus far comes at the hands of Quattro Pro, not Excel, anyway. Where Windows is concerned, existing 1-2-3 users will be glad they waited for this product," Fastie said.

## 1-2-3/W to Ship Without OLE

Lotus 1-2-3/W will ship without support for Object Linking and Embedding (OLE), contrary to Lotus' earlier claims. OLE remains key to the company's overall applications strategy, but the specification is still evolving, officials at Lotus said. A preliminary version of OLE resides in Lotus Notes 2.0.

"We want [OLE] nailed down. We don't want to ship something based on an early release that might change and might not work with other vendors' applications," said Jeffrey Beir, director of product marketing for Lotus spreadsheets.

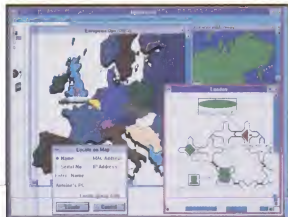
The technology lets users embed an object, such as a graphic, within a container application, such as Notes; when users click on the graphic, they bring up the application in which the graphic was created.

In August, Microsoft and partners — including Lotus and Aldus — will present proposals for an OLE spec level 2, which will be "a total superset of OLE 1," said Mike Maples, vice president of applications for Microsoft.

OLE 2 promises to further blur distinctions for the end-user between the container application and the embedded application.

"In the future, when you double-click on something created in one app, you [won't] feel like you're leaving the original app," said Pete Higgins, general manager of Microsoft's business unit.

Beir would not comment on how Lotus will put OLE into 1-2-3/W other than to say it would happen later this year. "We've architected the product so it can be added later," he noted.



Ungermann-Bass added a map interface to its NetDirector network management system that helps isolate faults.

## NetDirector to Provide LAN Management Map

BY YVONNE LEE

Ungermann-Bass Inc. will introduce tomorrow a network management system that gives managers a view of where network errors have occurred.

The NetDirector Topological Map is Phase II of the NetDirector Presentation Manager-based network management system introduced last December. The map is the new standard interface for NetDirector, the company said.

"The map just makes things easier to grab hold of," said Lynn Goodhue, director of systems and network services for information systems at Smith College, in Northampton, Massachusetts.

"If one of the NIUs [network interface units] is down, I can see which is red, and I can see what the fault is, [and] when it

occurred," she said.

The NetDirector Topological Map is customizable and integrated with a SQL database that tracks information about traffic and equipment on the network. Objects on the map change color when errors occur on the network.

NetDirector gathers information from the company's Access/One wiring hubs, but new Simple Network Management Protocol support gathers information from other vendors' equipment as well. Prices for NetDirector range from \$7,500 to \$16,000, depending on configuration. NetDirector customers not on the Ungermann-Bass support plan may upgrade for \$3,750 to \$8,000.

Ungermann-Bass Inc., 3900 Freedom Circle, P.O. Box 58030, Santa Clara, CA 95052-8030; (408) 496-0111.

## Apple Confirms Plan to Cut 1,500 Workers

BY LISA PICARILLE

Apple Computer Inc. confirmed last week that it will slice its work force by 10 percent over the next 12 months, despite an 85 percent increase in unit sales for the last two quarters.

The cutbacks, affecting 1,500 of Apple's 15,600 employees worldwide, are the largest in the Cupertino, California, compa-

ny's history. The cuts will come as layoffs, restructuring, consolidation, and attrition. Layoffs should be completed by June 28, the end of Apple's third quarter, said Apple spokesman Christopher Escher.

Also in that quarter, Apple will take a one-time restructuring charge to reduce \$300 million from its \$5 billion annual operating budget and increase sagging profits.

"The longer term implications are generally positive, because Apple currently has an expense structure 50 percent higher than the companies they compete with," said Peter Rogers, with Robertson, Stephens, in San Francisco. "If they want to be competitive they've got to have a lower cost structure."

Apple added 1,000 workers just before last fall's launch of the Macintosh LC and Classic. At the time, these low-cost machines increased Apple's market

share, their lower profit margins kept earnings flat for the quarter.

"We thought we could manage it down, but there were two big external issues: The dollar got strong in Europe and a general economic slowdown in major markets. That accelerated the process," Apple's Escher said.

Analysts expect the bulk of layoffs to hit sales and marketing employees as Apple begins selling through high-volume, low-cost superstores.

Apple confirmed last week that it will sell through superstores. The company is currently talking with CompUSA, official sales agent.

"[Consumers] are buying [low-cost Macs] for home use and those markets are being served by warehouse distribution," Rogers said. "Apple has a product line that pays extremely well into that shift."

### Apple's Layoff History

Year	Total Number of Employees	Number Laid Off
1981	1,000	40
1985	6,000	1,200
1990	12,500	400
1991	15,600	1,560

SOURCE: APPLE COMPUTER INC.

## Microsoft Forms Research Division To Focus on Computer Linguistics

BY LISA PICARILLE

Microsoft chairman Bill Gates' vision of "information at your fingertips" may in fact be on the tip of your tongue.

Microsoft Corp. is planning a new research division for computer linguistics and natural language processing. The Redmond, Washington, company hopes its findings will eventually enable users to search large databases using plain English, according to Nathan Myhrvold, Microsoft's vice president of advanced technology and business development.

The as-yet-unnamed group will focus on speech recognition, grammar checking, and computer linguistics. Other details, such as its overall size, location, and specific goals, have not been announced.

"We are interested in increasing our investment in both research and bringing the fruits of that research into products," Myhrvold said.

The research team, which falls under Myhrvold's direction, has already lured away some top scientists from IBM, George Heidron, Steve Richardson, and Karen Jensen — had been working on computer linguistics at IBM.

"Yes, we have hired some people that took advantage of early retirement some place else," Myhrvold said. "It is true that this is part of our investment, but we have no grand master plan. We are always interested in working with leaders in the field and it should come as no great surprise that Microsoft is always interested in hiring great people."

## Which UNIX® RDBMS did Hewlett-Packard®, IBM®, Unisys®, Data General®, AT&T®, Sun®, and Sequent® choose to demonstrate the power of their latest UNIX Systems? Informix.

### IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.

### New TPC Benchmarks Used

In each case, the Transaction Processing Performance Council's rigorous TPC A and/or TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

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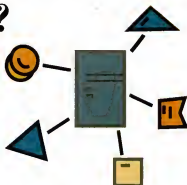
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### TP1 vs. TPC Benchmarks

The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similar to a batch test—focuses on database throughput.



### About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

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internal scalable typefaces give you thousands of options. And, to make things even more interesting, the LaserJet IIIP produces patterns, shading, spirals, and mirror images. In portrait or landscape.

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a new 16 MHz processor and PCL5 for on-the-fly typeface scaling and fast vector graphics. These

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## Corporate Offers Windows Training

Corporate Software recently announced its \$795 Windows Migration Project Planning Manual and announced initial dates for its Windows Migration Project Management Workshops. These train-the-trainer workshops are scheduled to begin June 3 in Philadelphia and will be offered in nine other cities nationwide. The workshops cost \$1,495. (617) 828-7727.

## SHIPPING

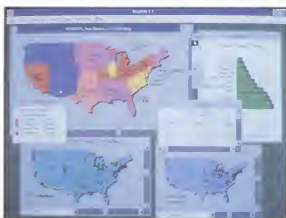
## Convergics Delivers 1-2-3 2.3 Modules

Convergics Corp. is now shipping @Project/Graph and @Project/Resources, add-in modules for Release 2.3 of Lotus 1-2-3. @Project/Resources performs critical path analyses; @Project/Graph lets users build and manipulate schedules directly on spreadsheets. Additional @ functions include @iscritical and @grecost. Developed by the authors of Project Calc, the \$149 @Project/Graph and the \$149 @Project/Resources are upwardly compatible. Registered users of Project Calc may receive these two modules for \$29.95. (619) 689-2433.

WordStar Corp. is shipping Correct Grammar for Windows. The product's support for Dynamic Data Exchange and the clipboard lets users check text generated in a host of Windows programs, including page layout, spreadsheet and presentation applications. With a retail price of \$119, the product is available to registered users of other versions for \$39; users of competing grammar checkers or any other WordStar product may purchase it for \$49. (415) 382-8000.

Metz Software, formerly Threaded Software Design Group, will ship next week Metz Lock, a password-based Windows security package. Lock, which features user-configurable options such as both automatic and manual lock-setting, costs \$49.95 for a single-user package. It works on stand-alone or networked PCs. (800) 767-6292, (206) 869-6292.

Continued on Page 25



MapInfo for DOS 5.0 touts improved functionality, including the capability for users to display a map with one keystroke.

## DOS 5.0 Version of MapInfo Announced

### Update Adds 'What If' Data Manipulation

BY KRISTI COALE

MapInfo Corp. is coordinating a DOS 5.0 version of its popular desktop mapping application, scheduled to ship in late June. MapInfo for DOS 5.0 puts more information in the hands of its users and affords them the luxury of testing several scenarios.

A redistricting feature lets users instantly generate "what if" scenarios on maps by re-drawing boundaries on territories. As a boundary is adjusted, MapInfo calculates and displays corresponding statistics.

The new version comes with U.S. census data that can be read directly from a CD-ROM drive, giving users demographic statistics down to the block level.

Other new features include shading based on the results of MapInfo's solving of thematic equations (such as dividing the

population by the number of households) and three-point digitizing for better alignment of paper maps on digitizers. The program also now incorporates interface improvements, such as a "View-All" function that can display an entire map with a single keystroke.

The \$995 DOS 5.0 MapInfo is available as a free upgrade to registered users who have purchased MapInfo for DOS within the last 90 days.

MapInfo also began shipping last week minor upgrades to its Windows and Macintosh products. MapInfo 1.1 for the Macintosh and Windows platforms include such features as dot-density maps and graduated symbols for a more accurate display of information.

Version 1.1 for either platform costs \$995.

MapInfo Corp., 200 Broadway, Troy, NY 12180; (800) FASTMAP.

## DataShaper Links Spreadsheets and Databases to PageMaker for Windows

Elseware Corp. has launched a program that serves as a bridge between Aldus Corp.'s PageMaker 4.0 for Windows and database or spreadsheet applications.

DataShaper 1.2 for Windows, which began shipping last week, lets users of PageMaker 4.0 for Windows bring in data from any database or spreadsheet application that generates comma- or tab-delimited files.

DataShaper 1.2 is transparent to end-users, according to Elseware. The program installs itself within PageMaker, where

it relies on and supports PageMaker's formatting attributes, in addition to its standard style tags, the company said. (See "Database Publishing Tools Link to Layout Utilities," April 22, Page 13.)

The \$249.95 utility supports TIFF, PCX, and Windows metafile graphics formats and can import in-line graphics files (files associated with specific text in a PageMaker document).

Elseware Corp., 3201 Fremont Ave. N., Seattle, WA 98102; (206) 547-9623.

— Kristi Coale

## TECHNOLOGY UPDATE

## Integrated E-Mail Moves Onto Word Processors

Macros Are One Approach to Linking Systems

BY ELIZABETH EVA

Word processor vendors are moving into the E-mail front, capitalizing on the growing number of network-based PC users.

Companies such as Microsoft Corp., WordPerfect Corp., and Software Publishing Corp. (SPC) are hoping to increase their appeal by offering the convenience of sending and receiving E-mail from within their word processors.

Microsoft and WordPerfect take similar approaches, relying on macro functionality to link with PC-based E-mail systems. According to Monica Harrington, product manager for Microsoft Word for Windows 1.1a, the word processor can link with any E-mail package that supports Dynamic Data Exchange, via the Word Basic programmable macro language.

Da Vinci E-mail for Windows, for example, includes a prewritten macro that enables Word for Windows users to call Da Vinci from within Word. When the macro is installed, menu options for sending and receiving E-mail are automatically incorporated into the menu.

When users select the E-mail options, the macro pops up a custom dialog box and transparently launches Da Vinci. Users can compose and spell-check messages within Word, as well as download received messages.

Microsoft Mail for PC Networks does not yet include a Microsoft Word macro, though Harrington said the company plans to add it eventually.

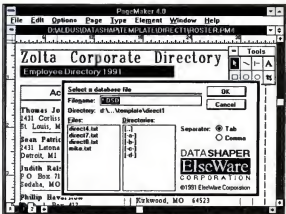
WordPerfect also offers a macro linking capability be-

tween the E-mail in its WordPerfect Office 3.01 workgroup software and WordPerfect 5.1.

WordPerfect Office ships with a DOS shell that enables users to hotkey into Office mail from within WordPerfect, according to technical coordinator Dan Bulley. Users can compose and spell-check messages within their word processor, but they must first save the message as a file before hotkeying into Office mail. Received messages must also be saved as files before they can be opened in WordPerfect.

SPC incorporates a full-fledged E-mail front end in its new Windows word processor, Professional Write Plus 1.0, which works in conjunction with an MHS 1.1 (Message Handling System) E-mail server. Pro Write Plus includes most E-mail features found in commercial packages, such as directory services, store and forward capabilities, and carbon copy, according to software engineer Greg Baker. Users can perform all their E-mail operations without ever leaving the Pro Write Plus environment.

Next March, SPC plans to release an update to Pro Write Plus that will incorporate enhancements made to Version 1.5 of MHS, released after Pro Write Plus 1.0 was finalized. New features include the capability to have up to 64 attachments per message (users are currently limited to one by MHS 1.1), a new receipt feature that notifies the sender when a message has been looked at, and the capability to store mail on personal hard disks rather than the MHS server. □



DataShaper 1.2 for Windows provides a transparent method for importing data files into Aldus' PageMaker 4.0 for Windows.

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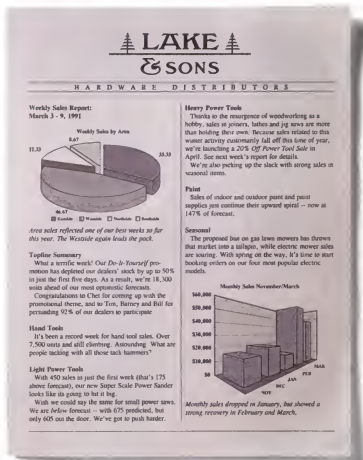
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## Solomon III Update Offers Improved Links, Reporting

Solomon Software recently updated its DOS accounting package to tighten links between modules and enhance reporting capabilities.

Solomon III, Version 7 also adds cash-basis accounting in the general ledger, accounts payable, and accounts receivable modules. The new general ledger module also keeps information for up to 99 time periods and makes it easier to

delete outdated transactions, according to the company.

Eleven modules, including payroll, fixed assets, and inventory, are available for \$795 each. The job costing module has a list price of \$995.

Although Solomon III, Version 7 runs on Novell NetWare local area networks, a single-user bundle — the Solomon III Equity Pack — is available for \$1,995.

The bundled package includes DOS system manager, general ledger, accounts payable, accounts receivable, payroll, fixed assets, inventory, purchasing, order entry/invoicing, and job costing modules. The software is available now.

Solomon Software, 1218 Commerce Parkway, Box 414, Findlay, OH 45839; (419) 424-0422.

— Barbara Darrow

## Microrim Ships dBase-Compatible RBase for OS/2

BY STUART J. JOHNSON

Microrim Inc. is shipping RBase 3.1A for OS/2. The database program still does not feature a Presentation Manager interface, but it performs 30 percent faster than its DOS counterpart, according to the company.

"I think we're the only database management system company with their current version running under OS/2," said Jack Noonan, Microrim president.

The package is also the only one for OS/2 that provides dBase compatibility and can coexist with dBase on a network, Noonan added.

"[Using dBase alone], if you're a dBase shop and are also moving to OS/2, you'd always have to run dBase in the compatibility box," said Mickey Friedman, Microrim's director of product marketing.

The new dBase support in RBase 3.1A for OS/2 is due to implementation of Microrim's Dynamic Data Integration (DDI), Friedman said.

DDI makes it possible for network users to dynamically access and manipulate dBase III or III Plus files as if they were RBase tables.

"We adhere to all of the Ashton-Tate locking conventions," Friedman said.

Another new feature, which Microrim calls Dynamic Application Integration (DAI), lets users run any OS/2 application from within RBase, company officials said. The update also takes advantage of OS/2's multitasking capabilities.

RBase 3.1A for OS/2 costs \$895 for a single-user version; the OS/2 LAN pack, which supports up to five users, costs \$995. Owners of RBase 3.1 for DOS can upgrade for \$99.

Microrim Inc., 15395 S.E. 30th Place, Bellevue, WA 98007; (206) 649-9500.

## Microsoft Incorporates Mail for PC Networks Into Office for Windows

Microsoft Corp. has added its recently introduced Microsoft Mail for PC Networks 2.1 to Microsoft Office for Windows.

Designed to provide new Windows 3.0 users with a starting lineup of applications, Microsoft Office 1.6 also includes the company's presentation graphics program, PowerPoint 2.0, as well as its word processor, Word for Windows 1.1, and its Excel 3.0 spreadsheet.

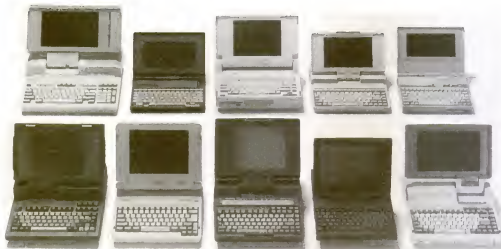
Microsoft Office 1.6 requires a 286 or higher PC compatible, Windows 3.0, 2 megabytes of RAM, and 12 megabytes of hard disk space. The package includes a single-user license for the E-mail software.

Through December 31, Microsoft Office is available for \$750. Users who license 20 units of Microsoft Office will receive a Microsoft Mail for PC Networks server pack at no charge through September 30.

The server pack normally lists for \$695.

Microsoft Corp., 1 Microsoft Way, Redmond, WA 98027; (800) 426-9400.

— Elizabeth Eva



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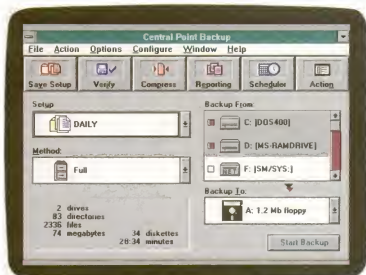
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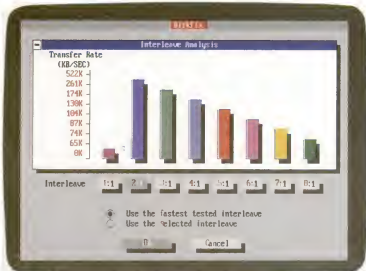
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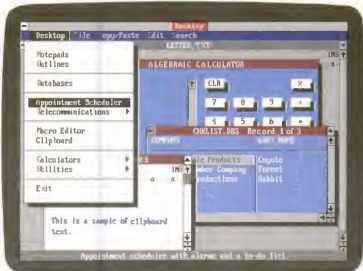
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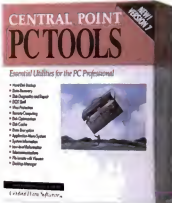
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## 2-D Cyber Animator Costs a Fraction of Autodesk Animator

A two-dimensional paint and animation package that costs less than half the price of Autodesk's Animator program was announced by Brown-Wagh Publishing at Comdex in Atlanta, last week.

Cyber Animator, developed by Antic Software of San Francisco, and marketed by Brown-Wagh, costs only \$199.95, but it includes most features found in the \$495 Animator package.

Unlike Animator, Cyber Animator supports high-resolution animations — 640 by 480 pixels. Animator supports only 320 by 200 pixels, although Animator Pro, a \$795 package, will display animations at both resolutions.

Cyber Animator also supports Creative Labs' Sound Blaster audio board and Autodesk's FLI file format.

The package's user interface includes pull-down menus, pop-up dialog boxes, buttons, and slide bars. Users can create animations using a palette of 256 colors, and they can add textures to those colors. Cyber Animator comes with zoom editing capabilities, and its drawing tools include freehand, airbrush, line, circle, smear, fill, polygon, box, and text.

In addition, users can create a 3-D effect by rotating animations around the x-, y-, or z-axis. Pixels can be manipulated to give a variety of visual effects.

Cyber Animator requires a PC XT or compatible, 640K of RAM, and a Micro-soft-compatible mouse.

Brown-Wagh Publishing, 130-D Knowles Drive, Los Gatos, CA 95030; (408) 378-3838.

— Nico Krohn

## Clip'nSave Handles Image Conversions And Screen Captures

Clip'nSave, Version 2.0 for Microsoft Windows, introduced by Dynalink Technologies Inc. at Comdex last week in Atlanta, provides versatile screen capture and image conversion tools.

The screen capture component allows users to define areas to capture — the entire desktop, specific windows, any rectangular portion of the screen, or windowed DOS programs. A freehand mode allows users to draw the area of the screen to be captured, and supports irregularly shaped outlines.

A hotkey capture feature allows the active window or entire desktop to be captured and printed.

The program also lets users view and convert images between TIFF, PCX, GIF, BMP, DIB, and RLE file formats. Single images or groups of images can be converted from one format to another.

Users can browse images in a preview mode, and copy them into any Windows application via the Clipboard. The product supports all 2-, 16-, and 24-bit color file formats. Automatic gray-scale palette mapping is also included.

Scheduled to ship next month, Clip'nSave 2.0 will cost \$149.

Dynalink Technologies Inc., P.O. Box 593, Beaconsfield, Quebec, Canada H9W 5V3; (514) 630-7663.

— Mark Brownstein

## Lucas Ports Its Artemis 7000 Project Manager to RISC and Sparc Platforms

Lucas Management Systems has broadened the market for Artemis 7000, Version 7.5, its project management package. Previously available for DEC VAX/VMS machines and 80386 PCs, the software can now also run on IBM's RS/6000 machines, Hewlett-Packard Co.'s HP 9000/800, and Sun Microsystems Inc.'s Sun 4 Sparcstations.

Artemis 7000, which is available in Unix or PC versions, provides gateways

to SQL databases, including Oracle and Ingres. It allows users to combine project management data with other corporate data so that specific dates from an Artemis project can be fed into a purchasing application, thus automating the flow of information between departments.

Version 7.5 also provides the capability to perform "what if" analyses by allowing two versions of the same project to be compared side by side.

Artemis 7000 7.5 uses the X Window graphical user interface on Unix, which enables users to access multiple applications from the same screen.

The PC version has a suggested price of \$6,000; the Unix-compatible application has a list price of \$17,900.

Lucas Management Systems, 12701 Fair Lakes Circle, Suite 350, Fairfax, VA 22033; (703) 222-1111.

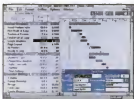
— Tuseda A. Griggs

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don't want to infringe on anyone's freedom of expression. But Charisma gives you so many graphic possibilities in one powerful, Windows-compatible program, we felt a warning was necessary.

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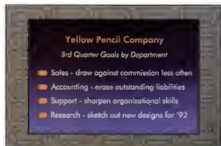
It's just as easy to get overly excited about the way Charisma lets you assemble entire presentations without switching between word processing, graphics and spreadsheet programs. Plus you see the results of your creativity immediately, since Charisma doesn't make you go back and forth between text and graphic screens. And with more than 30 import and export filters for graphic formats—



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\*Allow 4-6 weeks for delivery. Micrograph, Inc. 1303 Argente, Richardson TX 75081 • (214) 234-1749 (customers outside North America: please dial extension 3710). Micrograph has offices in Los Angeles, Paris, London, Munich, Sydney and Copenhagen. Copyright © 1991, Micrograph, Inc. All rights reserved. Micrograph is a registered trademark, and Charisma is a trademark of Micrograph, Inc. All other products are trademarks or registered trademarks of their respective owners. All chart elements created with Charisma.

## YourWay Contact Manager Adds a Network Version

Prisma Software Corp. has repositioned its Windows personal information manager as a contact management system and added a network version.

YourWay, Version 2.0, unveiled at Comdex in Atlanta last week, includes automatic history tracking and "next contact" information; a time, task, and call management system that prints to a variety of formats; and a report generator for tracking calls, projects, and contacts.

New to Version 2.0 are a proportional font word processor with spelling checker and thesaurus, and an automatic mail-merge, and support for Windows Dynamic Data Exchange (DDE).

The main work scheduling area consists of the daily calendar, which features a daily planner divided into 30-minute intervals. It also supports user-defined special dates and a conference trip scheduler. Colorful icons indicate attached notes and urgent calls; codes categorize the call as "original," "returned," or "call back."

The YourWay Network Version adds a group calendar and shared call management. A multiuser daily task manager allows group task scheduling and sharing. Contact history can be maintained in a secured master file, while multiple users can create and maintain individual contact files.

YourWay 2.0 will list for \$199 when it ships in August. A three-node network version costs \$595.

Prisma Software Corp., 2301 Clay St., Cedar Falls, IA 50613; (319) 266-7141.

— Scott Mace

## Texim Unveils Graphical Network-Ready Project Management Package

Texim Inc. has begun shipping Texim Project, a new project management package which is the company's first software tool to be made available in the United States.

The U.S. version adds more detailed resource management; an enhanced graphical user interface; and combined task, resource, and cost information for more comprehensive project overview and management reports.

The program offers such features as the capability to perform project-cost accounting and to create a baseline to compare your budget with actual costs. It also can give users a graphical view of project-cost performance as a function of time.

In addition, users can merge one project into another across file boundaries.

Texim Project is network compatible and offers password protection and file locking capabilities.

Texim Project is designed for use with PostScript and color PostScript devices, but it does not require a high-speed printer.

The program has a suggested list price of \$1,295 and is currently shipping.

Texim Inc., 833 Portland Ave., St. Paul, MN 55104-7418; (612) 290-9627.

— Tuseda A. Griggs

## IBM Improves DisplayWrite 5's Ease of Use, Reduces RAM Needs by 70K

IBM Desktop Software has modified its DisplayWrite 5 word processor, making it easier to use and curbing the program's RAM requirements.

Modification 3, with the graphics option included, now requires only 415K of memory on stand-alone and networked PCs, which is about 70K less than the previous version.

In addition, IBM has improved the program's search-and-replace and find

functions, and incorporated new list services capabilities and modifiable help instructions.

DisplayWrite 5 can now be used on the IBM PS/2 L40 SX, Sharp PC-6200, and Compaq LTE 386/20 laptop computers. Modification 3 also offers support for Banyan Vines 4.0. Users can now print to any available parallel printer port.

IBM has provided several new printer drivers, including support for the Hew-

lett-Packard Laserjet IIIID and the Panasonic KX-P1124.

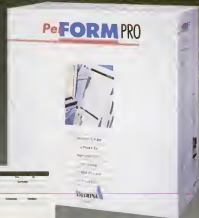
The program lists for \$495. Registered users of DisplayWrite 5 can receive Modification 3 at no charge by calling (800) 336-5430. Users of previous versions can upgrade for \$95.

IBM Corp., Mail Drop 274, 1133 Westchester Ave., White Plains, NY 10604; (800) IBM-7699.

— Elizabeth Eva

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Continued From Page 13

## ALLIANCE

## ExecuTrain Expands With Overseas Franchises

ExecuTrain Corp. last week announced that it has expanded overseas to Germany and France. The company also has plans for franchises in the United Kingdom and Ireland, to be established over the next five years. The French and German offices are scheduled to open in 1992; the training corporation expects to have 96 U.S. locations by 1993. It currently has 43 offices. (404) 396-9200.

## SHIPPED

## BPS Ships Laptop Version Of Presentation Software

Business & Professional Software (BPS) Inc. is now shipping a portable version of its 35mm Express desktop presentation software. 35mm Express/Laptop provides traveling users with the core capabilities of the desktop version of the package, without requiring a large amount of disk space. Users of 35mm Express/Laptop have a built-in fax option at their disposal, as well as a communications module for slide service bureaus. The \$295 35mm Express/Laptop is optimized for IBM PC-compatible notebook, laptop, and palmtop computers. A special Popet version is also available. (800) DIALBPS.

\*\*\*  
Data Access Corp. is shipping a WYSIWYG report writer that lets users send SQL statements to nonrelational databases. FlexQL imports and exports DataFlex, Lotus, dBase, Paradox, dBase, SYLK, and ASCII files. It exports WordStar, WordPerfect, and Microsoft Word mail-merge formats. It can also join different database file types. FlexQL costs \$295 for a single-user version, and \$595 per server for the LAN version. (305) 238-0012.

\*\*\*  
Intex Solutions Inc. has provided a whole stable of add-ins for Lotus 1-2-3 that are now compatible with the WYSIWYG spreadsheet publishing add-in, which ships with Lotus 1-2-3, Release 2.3. The 24 add-in products include 2-D Graphics, @Stats, Cambridge Spreadsheet Analyst, Financial Toolkit, and Ratio Master. In addition, a Release 2.3-compatible version of Forecast GFK, an upgrade to the existing forecast package that will take advantage of WYSIWYG, is scheduled to ship in June. Forecast GFK brings advanced forecasting techniques, including multiple regression analysis, to the Lotus spreadsheet. The product is available now at a price of \$165. Current Forecast users can upgrade for \$45. (617) 449-6222.

\*\*\*  
ZSoft Corp. is shipping Publisher's Paintbrush, Version 2.0 for Windows, its paint and image processing software that lets users edit gray-scale and color photographs and images. The \$495 upgrade now allows up to eight image files to be visible on-screen at once. Version 2.0 can edit with up to 16.8 million colors or 256 shades of gray for 24-bit image processing. (404) 428-0008.

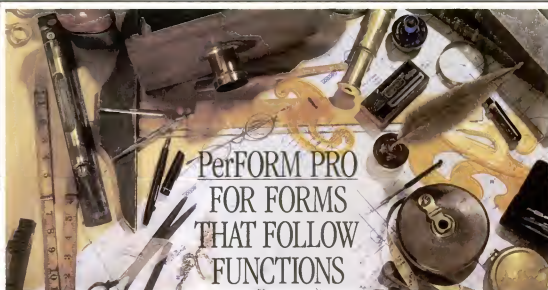
\*\*\*  
Sumak Enterprises Inc. is scheduled to begin shipping QuickGraph Plus, a DOS-based business graphing program, on May 28. The \$149.95 software creates graphs for business analysis and presentation; it provides 11 types of two-dimensional graphs, five types of three-dimensional graphs, and a variety of composite graphs. The program's features include sideways printing capabilities; a time-series function, which takes snapshots of frequently updated databases and appends key points to a

time-series file; and a batch file feature with which users can set up graph formats for frequently produced reports. (508) 443-5970.

\*\*\*  
Greengate Development Corp. is shipping FilePlus, a document image processing software package with a suggested price of \$495. FilePlus is designed to allow PC users to use a scanned image and electronically store and retrieve the image on magnetic or optical media. The software is created to support multiple optical discs and to

produce standard TIFF-compatible files without compression. (408) 773-0366.

\*\*\*  
Gamma Software is shipping Appointment Manager, a time management PIM that allows users to maintain and edit daily appointments. It also allows users to scan appointments by day, week, or month, and has search capabilities, along with a pop-up reminder function. Appointment Manager has a suggested price of \$49.95. (800) 776-9960.



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PerFORM Pro's WYSIWYG "Designer" software runs under Windows 3.0. And

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PerFORM PRO "Filler" runs stand-alone or networked. And takes the frustration out of form-filling, making it fast, easy and error-free. Multi-platform solutions enable any IBM PC user to take advantage of PerFORM PRO's powerful filling features. Like validation, database lookup, indexing and over 65 functions for automatic math calculations, "If... then" statements, date functions, financial calculations and more.

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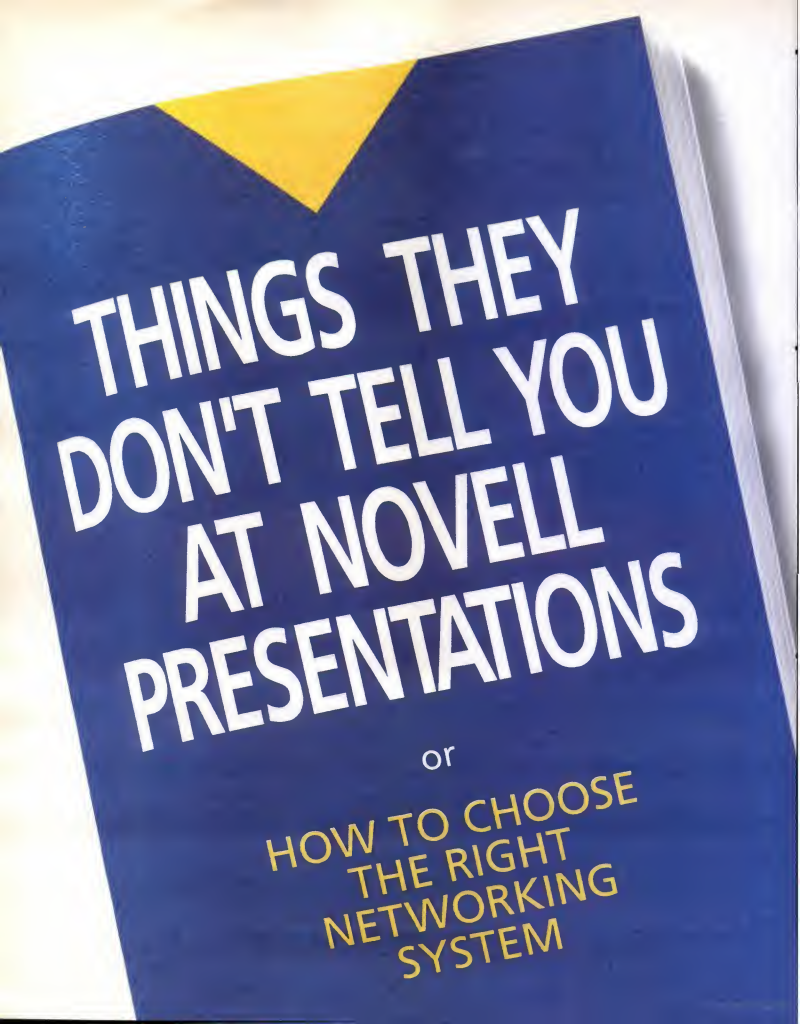
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## PROGRAMMING TOOLS

## PIPELINE

## ALLIANCES

## Microsoft Licenses CASE Technology

Microsoft has licensed the technology from Atlanta-based Caseworks' Case-W Windows code generator package for inclusion in future language products, the company said last week. Quick C for Windows, which is reportedly due out this summer, will use a stripped-down version to be called Quick Case, sources said.

Microsoft Corp. announced last week it has signed an agreement to let Powersoft Corp. sell SQL Server with its PowerBuilder client-server application development environment for Windows. (617) 229-2200.

## SHIPPING

## Lotus Releases Improv API Toolkit

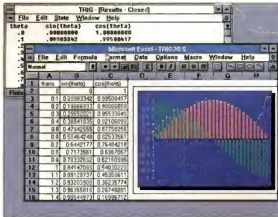
Lotus Development Corp. recently released an Application Programming Interface (API) Toolkit for Lotus Improv, its spreadsheet for the Next computer. The toolkit is available free to registered Improv users and Next developers. (800) 345-1043.

## UPGRADES

## Interbase Adds C++ to RDBMS

Interbase Software Corp. has added C++ to object-oriented programming support to its Interbase relational database management system (RDBMS), allowing developers to embed SQL in C++ code. Pricing for C++ support, which is separate from the database server, ranges from \$1,000 to \$5,000, depending on the hardware configuration. (617) 275-3222.

Network Research announced that its Fusion for HP Basic 6.0 supports Hewlett-Packard Co.'s Rocky Mountain Basic 6.0 operating system. One version includes an API that allows programmers to embed commands in their Basic programs that will automatically send and receive files. Fusion for HP Basic 6.0 sells for \$995 for the standard version and \$1,495 for the API version. (805) 485-2700.



To analyze data, users can cut and paste Fortran output into a program such as Microsoft Excel and view it in graphical form.

## Fortran Upgrade Ports Existing Code to Windows

BY STUART J. JOHNSTON

Microsoft will ship a new version of its Fortran language that lets users quickly move existing code to Windows, company officials said.

Microsoft Fortran 5.1, shipping June 1, provides two avenues to Windows programming, said Larry Engel, product manager for the new version.

Programmers can write code from scratch to use with Windows, or can now generate Windows Dynamic Link Libraries (DLLs) at compile time using the new support provided in the compiler, Engel said.

Alternatively, they can simply recompile existing Fortran programs using the QuickWin

libraries, which also come with Fortran 5.1, Engel said.

When compiled with the QuickWin libraries, existing programs gain a minimal Windows interface and functionality. Such programs can access all extended memory on 80286-based PCs and all virtual memory on 80386- and 80486-based PCs.

The package includes Microsoft's Fortran 5.1's "Workbench" integrated development environment.

Fortran 5.1 costs \$450; registered users of all previous versions of Microsoft Fortran can upgrade for \$150.

Microsoft Corp., 1 Microsoft Way, Redmond, WA 98027; (800) 227-4679.

## JAM/Presentation Interface Tool Helps Developers Build Windows Front Ends

BY ELIZABETH EVA

JYACC this week will introduce JAM/Presentation Interface for Windows, enabling developers to build Windows front ends with its JAM fourth-generation language (4GL) development tool.

Primarily for building data entry validation applications, JAM/Presentation Interface for Windows 1.0 provides support for the Windows multiple document interface, pull-down menus, dialog boxes, and clipboard. The program includes a menu-bar editor, and lets users specify screen creation, edits, and validations without having to write code.

The software provides complete support for all database extensions, according to Frank Vafier, executive vice president.

Users can write database queries directly in SQL, or have JAM generate the queries automatically. The program does not currently support Dynamic Data Exchange.

JAM/Presentation Interface for Windows, which lists for \$395, can be used in conjunction with six different JYACC database interfaces (DBI). Users must purchase a JYACC DBI (\$395 each) for each database they wish to work with — such as SQL Server — in addition to JAM itself (\$595) and a separate report writer (\$395). The product also requires the Microsoft Windows Software Development Kit. Because JAM generates executable files, JYACC does not charge run-time fees.

JYACC, 115 John St., New York, NY 10038; (212) 267-7722.

## Visual Basic Garners Third-Party Support

BY STUART J. JOHNSTON

ATLANTA — Third-party developers rallied around Microsoft's Visual Basic (VB) here last week to announce that they would provide custom controls for the new programming system.

Microsoft also announced it will ship by the end of June the \$95 Visual Basic Library for SQL Server, which lets VB users access SQL Server. The package includes the library and VB, but requires the separate purchase of SQL Server, said Charles Stevens, general manager of Microsoft's data access business unit.

Visual Basic will cost \$199 and ship in the next two weeks, Microsoft said. (See "Microsoft Visual Basic Promises 'C' Relief," May 20, Page 5.)

MicroHelp of Roswell, Georgia, will ship two sets of custom controls — Windows Dynamic Link Libraries (DLLs) that can be used in VB programs — when VB ships, said MicroHelp president Mark Novitski.

VBTools will cost \$129 and provide graphics special effects, custom controls, and callable utility services. The MicroHelp Communications Library will cost \$149 and provide routines for file transfer using popular protocols.

The company will ship MicroHelp Muscle, a \$189 set of assembly language routines for professional developers, including several toolbox modules, in July, Novitski said.

Hammerly Computer Ser-

vices of Laurel, Maryland, will ship two products for VB during the third quarter.

Probas VB will cost \$199 and add a multitude of new commands to VB, including string, data, and array manipulation and compression routines; file I/O routines; and drivers for VCRs and video-imaging boards. ProMath VB will cost \$125 and provide more than 150 scientific and engineering routines.

Crescent Software of West Redding, Connecticut, will ship by the end of the summer QuickPak Professional and PDQComm for Windows. The \$199 QuickPak provides custom controls, pre-defined dialog boxes, and data entry routines, as well as financial and scientific functions.

PDQComm for Windows, which will cost \$99, adds communications support to VB as well as windowed terminal emulations, said Ethan Winer, Crescent's president.

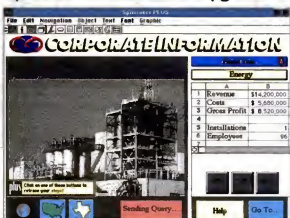
Frederick, Maryland-based Ward Systems Group will ship in June NeuroWindows, a \$295 neural network tool.

Pinnacle Publishing of Federal Way, Washington, will ship next month Graphics Server for Visual Basic, a \$149 graphing and charting tool, said David Johnson, Pinnacle's president.

Many vendors of existing Windows products also announced they will supply simple Basic declarations with which users can access their products from VB.

## PRODUCT SPOTLIGHT

## Spinnaker Announces Plus Upgrade



Spinnaker Software Corp. announced an upgrade to its Windows development system, Plus, last week at Windows World, in Atlanta. Scheduled to ship August 15 for \$295, Version 2.5 now delivers support for Dynamic Data Exchange (DDE) and Dynamic Link Libraries (DLLs), in addition to faster performance. (617) 494-1200.



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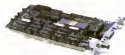
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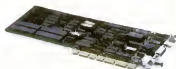
#### ISA (AT) 16-bit Family

Thick/Thin	NI6510	\$375
10BASE-T	NI6510-10BT	\$395
LatiaNet	NI6510-UTP	\$450



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LatiaNet	NI9210-16/UTP	\$595



#### EISA

Thick/Thin	ES3210	\$995
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replacement drive and rebuilds the "lost" data. So, you'll *never* have to down the Array or the host to replace a Hot Plug<sup>TM</sup> component.

In other words you stay in business.

The CORE Intelligent Array Subsystem is available in capacities of 1.3, 2.6 and 4.0 GB. And it is ideal for on-line transaction processing and other environments where data loss and downtime is simply intolerable.

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Data transfers up to 20MB/sec. Capacity to 112GB per

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## HARDWARE

## PIPELINE

## ANNOUNCED

## Acer Debuts EISA Multiprocessor PC

Acer America Corp. has entered the multiprocessor market with the introduction of the AcerForma 3000, which is designed to support as many as four 386/486 microprocessors in an EISA-based symmetric design. The system comes with a 64-bit Framebus in addition to EISA; as much as 6.4 gigabytes of storage; 8 megabytes of RAM, expandable to 256 megabytes; and 16 slots. The AcerForma system will ship in August with a list price of less than \$15,000. (408) 922-0333.

Media Vision has released the specifications of its multimedia upgrade kit, which will consist of its Pro AudioSpectrum board, a Sony CD ROM drive, and Microsoft Windows 3.0 with multimedia extensions. The product, listing for \$995 to \$1,295 depending upon configuration, will ship after Microsoft Corp. makes its multimedia extensions available. (415) 770-8600.

## ALLIANCES

## IntelliLink Connects Palmtop to Desktop

IntelliLink Inc. will provide a software bridge between Hewlett-Packard Co.'s new HP 951X palmtop and its NewWave office automation environment. IntelliLink's \$99.95 software is designed to enable users to transfer data from the palmtop to the desktop, and is expected to ship in the third quarter. (508) 264-9943.

ATI Technologies has licensed the 386 Display List Driver-VGA from Panacea Inc. for use with its VGA Wonder XL series of Super VGA boards.

## PRICE CUTS

## DPT Lowers Its Memory Prices

Distributed Processing Technology has cut the price of its cache memory expansion products by 17 to 25 percent. Its 2-megabyte memory module now lists for \$395, compared to a suggested price of \$495 previously. (407) 830-9522.

Continued on Page 34

## Kris Introduces 80386SX-Based Notebook System

BY TOM QUMLAN

Kris Technologies has expanded its line of notebook computers with a 20-MHz 386SX-based system.

Along with a more powerful processor, the Kris Master features 2 megabytes of memory, a VGA-compatible display capable of supporting 16 levels of gray at 640-by-480 resolution, a 3½-inch floppy disk drive, a mouse, and Windows 3.0.

A 40-megabyte hard disk drive comes standard with the Kris Master, but 20- and 60-megabyte drives are also available as factory-installed options. The system weighs 6.9 pounds, including the battery.

The new notebook also includes an 80387 coprocessor slot, two serial and one parallel port, and a connector for an external monitor. Options include memory expansion to 16 megabytes of RAM, an Ethernet adapter, and a fax modem.

The system comes with a one-year warranty; on-site ser-



One of two notebook systems from Kris, the Kris Master features a 20-MHz 386SX.

vice is offered through Dow Jones Service.

Kris expects to start shipping the new portable in June, with a list price of \$13,399.

A 16-MHz 386SX-based portable, the Kris Notebook offers a similar configuration with a 20-megabyte hard disk for \$2,895. The Kris Notebook, which can accommodate 5 megabytes of memory, is shipping now.

Founded in June 1990, Kris Technologies already offers a line of notebook and desktop computers, and graphics-related peripherals such as VGA boards and high-resolution monitors.

Kris Technologies, 260 E. Grand Ave., South San Francisco, CA 94080; (415) 875-6729.

## Toolkit Adds Mouse Support to dBase Applications

Developers of applications designed with dBase III Plus or dBase IV will be able to add mouse capabilities through the use of the dB Mouse Patch Toolkit from Mostly Mice Software.

The toolkit allows designers to add mouse support for pull-down and pop-up menus, and to enable users to transfer data from the palmtop to the desktop, and is expected to ship in the third quarter. (508) 264-9943.

mouse patch code can be run in a DOS window under Windows 3.0 with the mouse functioning appropriately inside the window.

Further, applications developed with the mouse patches can be compiled using Clipper Summer '87, and should be fully compatible with Ashton-Tate's Professional Compiler, the company said.

Mostly Mice Software is also

## Ergon Offers Windows Accelerator Board

BY MARK BROWNSTEIN

ATLANTA — An accelerator board that increases Windows 3.0's screen performance by tenfold was announced at Comdex here last week by Ergon Technologies Inc.

The 50-MHz XLR8-IT board — built around Chips & Technologies' Programmable Universal Micro Accelerator (PUMA) chip set — processes Windows Graphical Driver Interface (GDI) commands to speed up the screen generation process, a bottleneck in Windows' performance.

Because the GDI calls are offloaded from the processor to the XLR8-IT board, systems with slower processors will benefit more by using it. A 50-MHz 486 system would not improve as much as a 286 or 386, as the 486 chip can perform the commands at approximately the same speed as the PUMA chip set.

A version of the board designed to accelerate AutoCAD

performance is also offered by Ergon. The AutoCAD Accelerator can provide near instantaneous redraws. Real-time pan and zoom are also supported by the product.

In addition, printing can be implemented using PnScr as a hotkey.

The AutoCAD Accelerator can be purchased as a complete product (which includes the Windows acceleration capabilities) or as an add-on to the Windows product.

With the addition of a special controller card that can be installed in LaserJet II and III printers, first page print speeds can also be significantly enhanced. The LaserJet II/III adapter rapidly converts the video signal into instructions that talk directly to the LaserJet's printer engine.

Control data is sent directly to the printer engine, eliminating the need for extra printer memory for printing AutoCAD or Windows graphics.

The XLR8-IT is compatible with all VGA and Super VGA display adapters. The XLR8-IT Windows Accelerator Kit will sell for \$499.

The XLR8-IT AutoCAD Accelerator Kit (including the AutoCAD accelerator driver), will sell for \$649. As an add-on, the AutoCAD Accelerator Software will sell for \$249.

The Hewlett-Packard LaserJet II/III Adapter will be priced at \$129.

The products will begin shipping in June.

Ergon Technologies Inc., P.O. Box 748, Ridgeland, MS 39158; (601) 856-4968.

## Cardinal's 'Affordable XGA Board' Is Actually an Ordinary Super VGA Card

BY NICO KRONH

A graphics card introduced by Cardinal Technologies Inc. at spring Comdex last week was described as "an affordable XGA," but the board more closely resembles a Super VGA card.

A press release called the VGA 765 an XGA board. Cardinal officials acknowledged, however, that the board lacks XGA's graphics coprocessor, bus mastering capabilities, and performs operations no faster than other VGA and Super VGA cards.

At \$349, it would be an inexpensive XGA clone.

"The last thing I want to do is

give people the wrong perception," said Fred LaPointe, a product marketing manager at Cardinal. "We're giving people XGA-type resolution on an ISA bus."

The VGA 765 gives 640-by-480-pixel resolution in 65,000 colors. It also yields higher resolutions, including 800 by 600 pixels in 65,000 colors, and 1,024 by 668 pixels in 256 colors.

XGA, a \$1,095 graphics card developed by IBM, runs only on Micro Channel computers, and gives resolutions up to 1,024 by 768 pixels.

Cardinal Technologies Inc., 1827 Freedom Road, Lancaster, PA 17601; (800) 233-0187.

## ■ PRODUCT SPOTLIGHT

## DataProducts Unveils Level 2 Printer

DataProducts Corp. has introduced the first PostScript Level 2 laser printer.

The \$2,995 LZR 960 is based on a Sharp 9-page-per-minute engine and features the Weitek 8200 RISC processor. Outfitted for Macintosh and PC environments, the LZR 960 has AppleTalk, IBM PC, and conventional RS-232-C interface ports.

With Adobe System Inc.'s PostScript Level 2, the LZR 960 takes advantage of the forms and pattern caching features along with the improved memory management scheme and data compression features that are now a part of this page description language. The LZR 960 will ship in June. (818) 887-8000.



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The OL800: W/200 sheet 2nd paper tray



The OL820: W/200 sheet 2nd paper tray



The OL840: W/200 sheet 2nd paper tray



The OL800: W/multi-user port (3 add'l users)\*



The OL820: W/multi-user port (3 add'l users)\*



The OL840: AppleTalk Network Ready

Freedom of choice.

Your best choice in an 8 ppm page printer is the one that gives you the most to choose from: the Okidata OL800 Series.

With Okidata, you're free to choose the features you need, free to save money by eliminating features you *don't* need, and even free to change your mind later.

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### The OL800: No Frills, But All The Options.

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For only \$1499\*\* list, the Okidata OL800 gives you a full-featured 8 ppm printer: 26 fonts, 4 typefaces, HP Series® II compatibility, both serial and parallel interfaces, and the industry's only 5-year warranty—on Okidata's unique LED printhead.

As your needs grow, you can easily add options that are *no* option with the LaserJet® III—a second paper tray for more flexible paper handling, or a network port that automatically accepts output from three additional PCs in a workgroup. You can even upgrade your OL800 to match either of our high-performance printers described below.

---

### The OL820: Faster Than A LaserJet III.

---

Besides having more resident scalable fonts than the LaserJet III (13 versus 8), the OL820 also has more brains. Thanks to a unique hardware chip designed by Okidata engineers, it instantly solves complex font scaling, type rotation and grayscale problems "on the fly"—problems the LaserJet has to go back to its software to work out.

So the Okidata OL820 can deliver up to three pages of sophisticated text while

the LaserJet III is still thinking about printing its first page. In fact, InfoWorld magazine found the Okidata OL820 to be "the fastest office printer we've tested."

Second paper tray and 4-station workgroup options are available for your Okidata OL820 as well.

---

### The OL840: PostScript From PC To Mac And Back.

---

If Adobe PostScript® printing is on your menu, the Okidata OL840 offers it for \$700 less than a comparably equipped HP. Yet that low list price includes 35 genuine Adobe PostScript fonts, plus 26 bitmapped fonts (4 typefaces); 2 megabytes of installed RAM; plus serial, parallel, and AppleTalk Network® interfaces. You can connect the OL840 to both PC and Macintosh® workstations, and switch between systems instantly.

And the OL840 still leaves you with plenty of options—a second paper tray, extra memory, and a wide selection of additional PostScript fonts on easy-to-install ROM cards.

Finally, every Okidata OL800 Series printer has earned the Okidata OK!—your personal promise from us that it will deliver not just good value, but exceptional value...will provide not just adequate performance, but outstanding performance.

If you're looking for an 8 ppm page printer, your best choice is the one that gives you freedom of choice—the Okidata OL800 Series. For additional information call 1 (800) OKI-DATA



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\*\*Minimum order of \$1,000. \*\*\*Manufacturer's suggested retail price. Details price may vary. HP Series, LaserJet, AppleTalk Network, Macintosh are trademarks of their respective companies. Okidata is a registered trademark of Okidata America Inc. Marque déposée de Okidata America Inc. ©1990 by a subsidiary of Okidata America Inc. L1270. We don't just design it to work. We design it to work wonders.™ is a trademark of Okidata America Inc. (800) 451-4274

## NCR Fills Out Product Line With 5.6-Pound 386SX Notebook

ATLANTA — NCR Corp. last week filled a hole in its System 3000 strategy with a 5.6-pound notebook computer.

The NCR 3120, based on Intel's 20-MHz 386SX, fleshes out NCR's System 3000 world view, which sees a gamut of machines from laptops to massively parallel mainframe-class machines based on Intel's CISC architecture.

Although many notebooks struggle to get below 7 pounds, the 3120's 5.6 pounds include battery, and it measures 1.7 inches in height, company officials said.

NCR's notebook comes with a 30-megabyte hard disk drive, a 3½-inch floppy drive, and 1 megabyte of RAM. It also includes a backlit VGA LCD that gives a 12-to-1 contrast ratio. Users can add as much as 4 megabytes of RAM, as well as opt for a configuration that includes a 60-megabyte hard drive.

An optional fax/modem that transmits data at 2,400 bits per second (bps) and receives faxes at 9,600 bps will be available for \$695. Users won't be able buy a less expensive internal modem (as opposed to fax/modem) from NCR, said a spokesman for the company. The NCR 3120 will run as long as 3 hours on one battery charge, company officials said.

A base model will cost \$3,995 when it is released next month. A 60-megabyte hard drive version will cost \$4,395.

NCR Corp., Dayton, OH 45479; (513) 445-5000.

— Nico Krohn and Barbara Darrow

## Turtle Beach Comes Out Of Its Shell With 16-Bit Full-Size Sound Board

ATLANTA — Turtle Beach demonstrated a 16-bit sound board at spring Comdex here last week, offering better sound than most of the 8-bit sound boards currently on the market, but falling short of meeting Microsoft Corp.'s Level 1 multimedia specification.

MultiSound is a full-size card built around Motorola's DSP 560001 processing chip, a microprocessor capable of handling 10% million instructions per second (MIPS). It supports 8- or 16-bit recordings, and users can select 44.1 kHz, 22 kHz, or 11 kHz sampling rates. Lower sampling rates give poorer sound quality, but they take up less hard disk space. The card also has mono recording capabilities.

MultiSound, expected to ship in mid-August, will play back 32 MIDI voices. Unlike many audio boards, it doesn't use FM synthesis. Instead, it draws from a library of 151 digital samples of musical instruments stored in ROM. The board also allows MIDI input and output.

Though the board is equipped with a CD ROM mixer, it doesn't include an on-board CD ROM interface, which is where it fails to equal Microsoft's specification. It will ship with a driver for running Microsoft's multimedia extensions to Windows when those extensions are released in June.

Turtle Beach Systems, P. O. Box 507, York, PA 17405; (717) 843-6916.

— Nico Krohn

Continued From Page 31

### ANNOUNCED

## HP Offers Connectivity For Its Laser Printers

Hewlett-Packard Co. has announced six network printer interface cards for the LaserJet III, IIID and Series II, which connect these printers directly to a LAN. The cards come in Ethernet and

token ring flavors, and run under Novell NetWare or the 3com 3+ Open version of LAN Manager. Shipping June 3, the Ethernet cards list for \$695; the token ring cards, \$795. (800) 752-0900.

Agfa CompuGraphic last week announced the ProColor Premier, the first in a new line of desktop PostScript film recorders for the Macintosh and PC. At the heart of the ProColor is Agfa's XCS-24 Extended Color System, the company's 24-bit color technology for transferring digital images to film. Ship-

ping in June, the \$7,495 ProColor supports SCSI and GPIB interfaces. (508) 658-5600.

Samsung Information Systems America enters the Unix marketplace with a 33-MHz 80486-based system designed to run under Unix. The EISA-based SystemMaster 486/33TE is positioned as a file server, and will list for \$7,699. (408) 434-5653.

Altos Computer Systems has introduced two 486SX-based systems. The



WITH OUR NEW SX MODELS, IBM MAXIMIZES THE POWER OF THE INTEL 486 CHIP, AGAIN.

When the IBM PS/2<sup>®</sup> Models 90 and 95 XP 486™ were introduced, they burst from the starting gate with incredible power, and have held their lead brilliantly. With the introduction of the new 20 MHz SX™ models, IBM offers lower-cost entries that deliver high-powered computing. So no matter how diverse your needs, we have a champion ready for you.

All the Models 90 and 95 are designed to use the most advanced components to achieve optimum balanced performance in power, speed, storage, memory and VGA graphic resolution. Like their forerunners, the new 90 and 95 XP SX models possess a 64-bit processor-to-RAM path and advanced Micro Channel™ 32-bit architecture for lightning-fast data flow and improved data integrity. The 4MB RAM standard on the SX models is doubled to 8MB on the 25 and

1820 and 1824 486SX systems come with either a 200-megabyte or 435-megabyte hard drive. Prices start at \$10,000. Shipments are due in July. (408) 922-0333.

Kris Technologies has introduced a 14-inch monitor, the 14NVC, which is capable of displaying resolutions of 1,024 by 768, with a dot pitch of 0.28mm. The monitor works with IBM PCs and compatibles, and Apple's Macintosh II line. The monitor is expected to start shipping this quarter, and will

list for \$575. (415) 875-6729.

**Micro Solutions Computer Products** has announced a 3½-inch hard disk drive that has capacities ranging from 40 to 120 megabytes. The drives, which are expected to ship in August, are designed to be connected to a computer through a printer port. Pricing ranges from \$650 to \$995. (815) 756-3411.

**STB Systems Inc.** has introduced a VGA board that is capable of supporting

as many as four monitors at one time. Each port on the MVP-VGA board comes with its own Digital Analog Converter for separate color palette control. A two-port version lists for \$1,095; the four-port board has a suggested price of \$1,995. (214) 234-9750.

**Personal Computer Card Corp.** has introduced LapGuard, a security system for laptop systems. LapGuard requires a KeyDisk for installation into the portable's floppy drive and a password to access the system. Expected to ship this

month, LapGuard lists for \$99. (800) 992-1079.

## UPGRADES

### Fremont Communications Adds Modem to Fax96

Fremont Communications has added a 2,400-bit-per-second (bps) modem to its existing 9,600-bps facsimile board. The Fax96 with Modem also offers MNP5 2-to-1 data compression and has a list price of \$249. The product is expected to ship this month. (415) 438-5000.

**Laptop Solutions Inc.** is offering users of Toshiba's T5100, T5200, and T5200C portables a 425-megabyte hard disk upgrade for \$2,995. The system price includes installation, formatting, a one-year warranty, and 24-hour burn-in and testing. (713) 789-0878.

**CE Infoeasy America** is now supporting OS/2's High Performance File System (HPFS) with its SCSI controllers. The company will also provide software support for booting up OS/2 from a SCSI device, and low-level formatting. (800) 322-3464.

## SHIPPING

### SAI Systems Laboratories Ships 386SX Notebook

SAI Systems Laboratories Inc. is shipping its 386SX SAIbook notebook, a 5-pound 386SX system with a 20-megabyte hard disk and a suggested list price of \$2,395. The system ships with 2 megabytes of memory and a black-and-white VGA-compatible display. (203) 929-0790.

**Educational Systems Inc.** is shipping a full-size mouse pad that can be configured with templates for software applications such as Lotus 1-2-3, Excel for Windows, PageMaker PC, and Word for Windows. The MicroRef SmartPad costs between \$9.95 to \$19.95, depending on the templates ordered. (708) 498-3780.

**Ariel Corp.** is shipping a digital signal processing board for the PC that is capable of performing as many as 60 million floating-point operations per second. Designed for audio and image processing, the DSP board lists for \$4,995 and comes with a set of development tools. (908) 249-2900.

**GIE America Inc.** has introduced a 540-line-per-minute dot-matrix printer. It is available now and priced at \$5,895. (800) 877-1421.

## BUNDLES

### Sony Offers Lotus 1-2-3 Demos With Diskettes

Sony Magnetic Products Group is offering a demonstration disk of Lotus 1-2-3 3.1 in 10-packs of its 2DD and 2HD floppy disk drives. The promotion, which started in April, is scheduled to last through July. A coupon for a 25 percent discount on Lotus 1-2-3 training classes is also included. (201) 930-6432.

# got a champion, the line.



33 MHz models, so challenging hurdles like multimedia are easily cleared. The 25 and 33 MHz models also include a math co-processor for improved performance in numeric-intensive applications like financial modeling and CAD/CAM.

But perhaps the most compelling feature of today's champions is their ability to adapt to the needs of tomorrow. With Expandable Processor (XP) technology, all models can easily be upgraded to speeds faster than 33 MHz in the future. With the standard SCSI busmaster, additional hard drives, tape drives and printers can be added. You can even add multiple processors with Micro Channel busmaster adapters.

So what you get is a machine with the kind of strength, flexibility and staying power that makes a real champion.

To find out more about the leaders in 486 technology, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.

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going to do it?  
PS/2 it!

**IBM**





## Fujitsu Readies DOS-Based Hand-Held PC XT Compatible

BY TUBEDA A. GRAGGS

The AcuTote 3000, a hand-held PC XT compatible with 100 percent support for MS-DOS, from Fujitsu Systems of America, will start shipping next week.

Fujitsu intends to direct its marketing of the hand-held system toward retail accounting, materials handling, distribution, and other retail applications where similar systems have already found a niche, said Dave Baker, Fujitsu's director of hand-held systems sales.

The AcuTote uses nickel-cadmium batteries that run for eight to 10 hours without recharging. The hand-held system has an intelligent charging system

that prevents it from overcharging.

The AcuTote 3000 system is based on the 8-MHz 80C88 microprocessor, and can upload captured data and accept downloaded file data from host systems. It also includes 64K or 128K of ROM and 256K to 640K of CMOS RAM, and a CGA-compatible LCD screen with a 10-line display.

The portable is available with keypads

of 30 or 49 keys. It is bundled with MS-DOS 3.22, AcuTote Basic, Microsoft C, and uses all PC XT-compatible languages and applications.

Fujitsu also offers optional memory cards that provide as much as 2 megabytes of RAM.

The hand-held machine is compatible with the Direct Exchange/Uniform Communications Standard (DEX/UCS) sup-

porting the electronic data transfer of Direct Store Delivery (DSD) information.

Fujitsu's 1.65-pound machine lists for \$1,995, and measures 9.8 inches by 3.6 inches by 2.1 inches. The company offers quantity discounts for multiple systems ordered.

Fujitsu Systems of America, 12670 High Bluff Drive, San Diego, CA 92130; (619) 481-4004.



The AcuTote 3000 is a DOS-based system designed for the hand-held order entry/forms recording market.

## Fast Technology Ships TenTime Real-Time Mirroring Software

Fast Technology Corp. is now shipping TenTime Advanced Mirroring System (TAMS), a software package designed to provide real-time mirroring of disk drives or drive partitions.

Mirroring is the process of writing identical data to two drives. If one drive fails, or the data is somehow damaged on one disk, the data can be recovered from the mirror disk.

Loaded as a device driver, TAMS uses only 20K of memory. TAMS can be used on drives attached to ESDI, SCSI, IDE, RLL, or MFM controllers. The TAMS software can work with different types of drives simultaneously as well.

TAMS can also mirror data across partitions on a single drive. Although the mirroring software does not have all the performance advantages available on Redundant Array of Inexpensive Drives (RAID) systems (such as automatic head positioning to read from the drive where the head is closest to data), most RAID devices cannot use dissimilar drives.

TenTime Advanced Mirroring System is now shipping. It is priced at \$395.

Fast Technology Corp., 3204 S. Fair Lane, Tempe, AZ 85282; (602) 438-0889.

—Mark Brownstein

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It shows how NewWave's simple object model lets you work on one desktop

environment, instead of having to use both the Program and File Managers. You don't have to understand the DOS file system at all. And it works with the Windows applications you already have.

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To evaluate NewWave, call (408) 376-2727 for your interactive demonstration disk. (Handling charge \$3.95.) Then experience one of the most dramatic breakthroughs ever brought to your screen.



**HEWLETT  
PACKARD**

# Packard Bell Bundles GUI With Its First High-End 386 PCs

By TOM QUINLAN

Packard Bell's computer line now includes higher end models that are based on 20-MHz 386SX and 25-MHz 386DX chips and designed for use with OS/2 and Novell networks.

Both systems come with 2 megabytes of Extended RAM, a 125-megabyte hard drive, standard VGA graphics with 512K of video RAM, a 2,400-bit-per-second fax/modem, 3½-inch and 5¼-inch floppy disk drives, and a 101-key keyboard.

The 20-MHz 386SX-based 520SX also comes with 16K of RAM cache on the motherboard, four expansion slots, and room for an additional internal drive. It can be configured with 16 megabytes of memory on the motherboard.

The 25-MHz 386-based 725DX, Packard Bell's most powerful system, can be expanded to 32 megabytes of memory on the motherboard. It comes with seven expansion slots and a 150-watt power supply.

PB Desktop, Packard Bell's first foray into designing its own user interface, will be bundled with the systems. The graphics-based interface features on-line tutorials and an icon-driven application menu that enables users to call up their applications, much like the Macintosh or

Windows 3.0 interface.

Users can select as many as 100 DOS programs that can then be displayed and accessed with PB Desktop, according to the company.

The software will also itemize Packard Bell's service and support programs, including bulletin board telephone numbers and technical support hot line.

Packard Bell intends to start shipping

PB Desktop with new models of its 80286-based Legend 100 and Legend 200 systems, the 520SX and 725DX systems, and its 16-MHz 386SX-based 316SX and 416SX systems.

MS-DOS 4.01, GW-Basic, and Lotus-Works will also be shipped installed on Packard Bell's systems.

List prices for the new systems start at \$3,099 for the 520SX; the 725DX has a

suggested price of \$3,599.

In recognition of the recent round of price cuts that's sweeping the industry, however, the company expects street prices to be significantly lower. The 520SX is expected to sell for as low as \$1,900, and the 725DX may sell for approximately \$2,200.

Packard Bell, 9425 Canoga Ave., Chatsworth, CA 91311; (818) 773-4400.

## Micropolis to Launch Fast, Large-Capacity 3½-Inch Hard Disk Drive

By MARK BROWNSTEIN

Micropolis Corp. plans to enter the 3½-inch hard drive market with one of the largest drives available in that form factor.

The Model 2112 has a formatted capacity of slightly more than 1 gigabyte and features an average seek time of less than 10 milliseconds.

Furthermore, the Model 2112's integral controller performs multisegment read-ahead caching and tagged command queuing, which reduces the drive's access time.

The drive comes standard with an integral SCSI-II controller.

The drive's high capacities were reached by increasing the storage density to 93 million bits per square inch, and using eight platters. Multizone recording further increases storage capacity by writing more data on the outer tracks of the platters.

Increased data transfer rates are made possible by spinning the platters at 4,500 revolutions per minute (RPM). Most currently available drives use a 3,600-RPM spin rate.

Integrated into the controller are capabilities to support array technology developed by Micropolis, putting much of the array intelligence onto the drive controller, instead of requiring the CPU or a SCSI adapter to handle array communications.

The Model 2112 hard disk drive will begin shipping in the third quarter. Pricing has not yet been determined, although the company expects the drive to sell for less than \$1,000.

Micropolis Corp., 21123 Nordhoff St., Chatsworth, CA 91311; (818) 709-3300.

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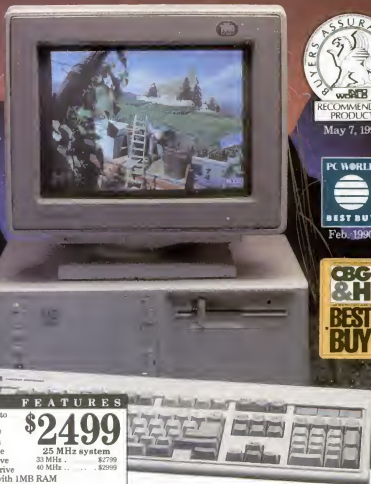
InfoWorld® May 7, 1990

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October 31, 1989



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## TECH TALK ■ BY STEVE GIBSON

# Visual Basic Is a Powerful Tool for Programmers of All Levels

Microsoft Corp.'s new Visual Basic product is destined to dramatically change the way people feel about and use Windows. In the few days I spent learning and understanding this new system, I stunned myself and my coworkers by creating two significant networked applications, as well as several simpler, experimental programs. Although deliberate programming still lies at the heart of Visual Basic, and complex applications can still be complicated, it rapidly rewards investment and sucks you into finding out more about how to make it do the things you want.

After Microsoft left a copy of Visual Basic with me, I began to play, skipping a night of sleep just to cram more Visual Basic time into my life. It really is that addictive. In the past few weeks I've written several rather significant applications that I would have never attempted to write in any other programming environment. I would simply have gone without.

Visual Basic will succeed as few products ever have by offering significant value to an extremely wide audience. Casual computer hobbyists will enjoy crafting their own entertaining applications that look as good as anything commercially available. Corporate developers can quickly assemble sophisticated and readily maintainable networked ap-

plications to suit their company's unique needs. Because Visual Basic applications have full access to Dynamic Link Libraries (DLLs) and Dynamic Data Exchange (DDE) links of other applications, you can use Visual Basic to provide customized extensions to existing applications, as well as to glue together disparate applications.

Consultants will be able to build custom packages overnight to solve their clients' needs. Consultants will also be able to charge more and deliver more by capitalizing on Visual Basic's amazing programming leverage. Full-time Windows developers, who would probably choose not to develop their commercial applications in Visual Basic, can still use it to quickly implement prototype user-interface scenarios for management's approval. What is more, less technical front-end designers of commercial products can quickly prototype their ideas for final implementation by SDK power programmers.

Finally, because the entire Windows Software Development Kit (SDK) function library is directly available through Visual Basic, would-be SDK developers will be able to easily learn and experiment with the operation of the Windows SDK functions from within Visual Basic's environment.

Although Visual Basic has something for every programmer, I don't want anyone to get the impression that Visual Basic will instantly turn everyone into a

programmer. It is better to think of Visual Basic as an incredible power tool for existing programmers of any level. Unlike Borland's ObjectVision, which uses the metaphor of fill-in forms driven by graphical decision trees to create living "instructions," Visual Basic is not a product for nonprogrammers.

Visual Basic uses a "project" concept to collect and organize the application's component files. A Visual Basic project consists of one project "make file"; one global file; and zero or more forms, code modules, and controls extension files.

The project's make file lists the collection of files upon which the project depends. When a project is opened, the make file window shows the file name and its corresponding project name for each file component. Choosing Save Project saves any of the project's files that have been changed.

Every project also consists of one global declaration file that places projectwide constant and variable declarations. A `CONSTANTS.TXT` file is usually loaded into the project's global file to provide a number of systemwide constants. Because the global file cannot contain executable code, each project also requires a minimum of at least one form or code-module file containing executable instructions.

The form files are perhaps the most interesting because they represent and define the visible surfaces in a Visual Basic application. When you create a new project, one form is created by default, though this may be removed for applications not requiring significant user interaction. Code-module files contain executable code that's not directly related to individual forms controls. For example, a general-purpose subroutine library might be placed into and referenced in a code-module file.

Controls extension files allow the standard Windows controls, such as push buttons, radio buttons, check boxes, and scroll bars, to be extended beyond those supported by Windows. SDK power programmers can create libraries of additional controls, such as gas gauges and slider knobs, and provide them for Visual Basic programmers' use. I predict that we'll see an active market of these Visual BasicX (Visual Basic X-tension) controls before long.

When you first start a new project, a blank form is presented. To the form's left is the familiar toolbox menu. Unlike a simple drawing program that rubberbands rectangles, circles, etc., Visual Basic allows users to draw command buttons, radio buttons, check boxes, text boxes, list boxes, scroll bars, and all the other familiar Windows objects. If you've loaded Visual BasicX files into the project's make file, their own toolbox icons will also appear appended to the standard Visual Basic toolbox. The significant difference with Visual Basic is that these are actually living, functional control objects that are "wired up," rather than being dead images of Windows controls.

It's convenient to think of a form as a visible surface containing controls with control-handling code buried underneath. Double-clicking on any form's control objects takes you beneath the form's surface to that object's collection

of associated methods. For example, double-clicking on the first command button that was created on a form would take you to a window containing two lines: "Sub Command1 — Click()" and "End Sub." "Sub" is short for subroutine, and the name "Sub Command1 Click" indicates that it will be automatically executed by Visual Basic when the user clicks on the Command1 button. This means that each control object is associated with a collection of subroutine methods that are invoked when the respective action is received by the control.

In addition to subroutine methods, every Visual Basic object maintains a collection of internal properties. Object properties are like internal variables that specify such design-time elements as form control location and name. Some control-time elements such as whether or not the control is enabled or visible at this moment. Even with forms that contain control objects, you can set such properties as outline style and whether or not they're resizable and minimize at run time.

The properties assigned to objects are referred to in program code with a familiar record-style "dot" syntax. For example, you could access a command button's width with "Command1.Width." Most properties can be determined and changed by program code.

Because most object properties are accessible both at design time and during run time, many unusual effects are possible. For example, in the first application I designed, a control button shot across the control panel hitting the far edge, then it bounced along to its final position. In another application, an instructions list initially appeared above a three-line list box. When a user had finished reading the instructions and started the application by clicking on the start button, the instructions disappeared and the list box opened to full operating size. I was able to achieve these effects by altering the object's initial design-time properties during run time.

Visual Basic allows easy tinkering and fiddling with your experience of a Windows application, resulting in Windows EXE applications that have more intrinsic friendly functionality. In addition, such applications would be impossible to create without Visual Basic's leveraging power.

The people for whom I've demonstrated Visual Basic have evidenced the standard turned-up nose at the notion of programming in anything named Basic. I've explained that this is just a standard Microsoft dementia about the insistence of the term Basic's usage. Yes, I wish Microsoft had kept the name "BasiX," the product's internal code name, just as Apple left their winning graphical machine named Macintosh. On the other hand, after seeing how Visual Basic has empowered me to create Windows applications for the first time, even my skeptical Basic-hating friends have wanted to get their hands on it. I predict that you will, too.

Steve Gibson is the developer and publisher of *Spinrite* and president of Gibson Research Corp. of Irvine, California. The views expressed are his own.

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# NETWORKING

## PIPELINE

### ANNOUNCED

#### 3+ Open Users Can Upgrade to MS Mail

Users of 3Com's 3+ Open Mail and 3+ Mail can upgrade to Microsoft Mail for PC Networks 2.1 for \$99. The offer includes 100-user licenses, and post office and message transfer software. The upgrade offer is valid through December 31. Microsoft also plans to offer a utility that converts 3Com messages to Mail for PC Networks messages this summer, and a gateway between the 3Com products and the Microsoft product by the end of the year. (206) 882-8080.

Cabletron Systems Inc. will incorporate Touch Communication's Alliance Open Systems Interconnection (OSI) software into its Remote LANView/Windows and Spectrum network management products. Cabletron will also incorporate the software into its line of Ethernet, Token Ring, and Fiber Distributed Data Interface (FDDI) products. (603) 332-9400.

### SHIPPING

#### ODS Releases Two FDDI Concentrators

Optical Data Systems' 10-slot ODS 1090 and the six-slot ODS 1091 support 42 users and 18 users, respectively. Both concentrators support the FDDI Standard Management Protocol and the Simple Network Management Protocol. Pricing for the 1090 begins at \$21,425, and for the 1091 at \$19,995. (214) 234-6400.

### PRICING

#### Hughes Cuts Prices on Its ProLine 2.0

Hughes LAN Systems has reduced the price of ProLine 2.0 connectivity software by as much as 31 percent. A single-user package now costs \$450, and the 25-user pack is \$350 per user. (800) 395-LANS.

Kodak Technology has dropped the prices of its network interface cards for Ethernet LANs. The Dual-LAN card now sells for \$499 and the Quad-LAN card costs \$799. Both cards are used to link multiple LANs with a single card. (408) 441-6900.

Continued on Page 48

## Extra for Windows 3.2 Upgrades DDE Support

Customized DDE Allows Data Exchange

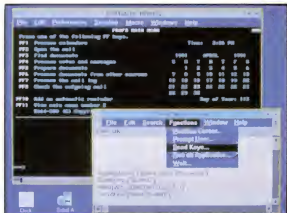
By DAVID COURSEY

More powerful macros, better Dynamic Data Exchange (DDE) capabilities, and full support for Visual Basic are part of Attachmate Corp.'s updated Extra for Windows' micro-to-mainframe communications package.

A new macro generator lets users create and edit scripts for automating common tasks such as gathering E-mail. Users can record their keystrokes and revise them using an interactive editor. Pull-down menus and dialog boxes automatically generate macros in 3270 Basic, said Mike New, Attachmate's vice president of marketing.

The new release adds a specialized "host-aware" implementation of DDE, the Microsoft standard for exchanging information among Windows applications. Unlike most PC applications, mainframe programs often display data on several different screens, and each is updated only when summoned by the user, New said.

Conventional DDE cannot easily pass information from multiple host screens. Attachmate Extra solves this problem by using macros to access appropriate screens, gathering information from each before passing the data via DDE to another application, New said.



Extra for Windows 3.2 host connectivity software now contains automation tools including a macro editor and host-aware DDE.

Support for Microsoft's new Visual Basic gives programmers access to Extra's DDE and application programming interfaces (APIs), as well as supporting the creation of custom mainframe commands.

API support includes the Emulator High-Level Language API (EHLAPI), which is IBM compatible and allows a single PC to interact with the mainframe, and a Windows High-Level Language API (WHLAPI), optimized for multitasking, New said.

Attachmate Extra also provides pass-through of HLLAPI commands from DOS applications run from inside Windows, providing support for existing programs in the graphical environment.

Extra for Windows, Release 3.2 is available now and priced at \$425, including unlimited toll-free telephone support. Upgrades from earlier versions are \$75.

Attachmate Corp., 13231 S.E. 36th St., Bellevue, WA 98006; (800) 426-6283.

## Updated NetWare Server Improves Remote Access

By JODI MARDESH

Macintosh users can access DOS applications on their LANs with Novell's updated NetWare Access Server, Version 1.2.

The product has been enhanced to work with higher speed modems and across X.25 links. The NetWare Access Server allows as many as 16 remote users to dial in and access NetWare systems. It can be run locally on a network as a LAN-based DOS applications server, which enables Mac users to log into a NetWare server and run DOS applications. This eliminates the need to have two personal computers at the desktop. Previously, Mac support was only extended to remote users.

The product works well, especially compared to previous versions, said beta testers.

"This version is much cleaner, both in setup and also in its use," said David Howard, technical coordinator for Brigham Young University's information system services, in Provo, Utah. "It has a better guided-menu system, and more options," he said.

The support for Macintosh clients is helpful to BYU, Howard said. "With 3.11, it works with the Mac LANtapes and creates an IPX session to the network, so Macs can run a DOS session," he said. "We're thinking of some other ways to utilize that. Our religion department has an index of the Bible and

other religious books, yet Macs can't access the databases."

NetWare Access Server now supports modems that operate at 38.4 kilobits per second. The server also supports third-party adapters from IBM, Specialist, and Newport Systems Solutions. Previously the server only supported Novell WMIN+ communications adapters.

Support for the Newport Systems Solutions X.25 Communications Interface (XCI) lets remote PCs access a NetWare server over an X.25 network. Because X.25 networks can connect to multiple remote locations through one port, the solution can save the cost of a separate communications line and hardware for each connecting PC, according to the company.

The NetWare Access Server 1.2 also supports cards with as many as 16 ports, so only one card is required to use the server's 16 virtual PCs.

A feature that BYU's Howard would like to see is support for TCP/IP sessions over the Access Server.

"That's one of the problems the Access Server has. It would be nice to be working on something in your own environment, going to a mainframe, and downloading information to your local NetWare host," Howard said.

NetWare Access Server 1.2 is shipping now and costs \$2,395. Upgrades from previous versions are available for \$895.

Novell Inc., 122 E. 1700 S., Provo, UT 84606; (801) 429-7000.

## First LattisNet Engine Applications Announced

Two Third-Party Programs Are Now Available

By YVONNE LEE

SynOptics Communications Inc. last week announced the first third-party applications to take advantage of its LattisNet Network Control Engine (NCE).

The NCE is a distributed management system based on Sun Microsystems' Sparc microprocessor, which began shipping last March.

The new applications — NetMetric Protocol Analyzer and NetMetric Load Monitor — from Matrix Computer Systems Inc. of Nashua, New Hampshire, augment SynOptics' LattisNet Network Management for Unix.

The programs use X Window, and they include a floating license that allows managers to display the applications from any X terminal on the network.

The NetMetric Protocol Analyzer captures packets according to filtering criteria, disassembles the packets, and graphically displays them.

The current version of the analyzer disassembles Address Resolution Protocol (ARP), Re-

verse Address Resolution Protocol (RARP), Internet Protocol (IP), Internet Control Message Protocol (ICMP), User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Telnet, Network File System (NFS), Mount, Portmapper, and SunRPC packets. A future version will decode DECnet, AppleTalk, and Novell Internetwork Packet Exchange (IPX) packets, according to the company.

The NetMetric Load Monitor tracks network traffic and keeps statistics in shared memory on the Network Control Engine (NCE). It characterizes network load by interval, source nodes, destination nodes, protocol, application, and packet size.

Software licenses for NetMetric Protocol Analyzer and Load Monitor are each \$1,995 per NCE. Three licenses cost \$3,995. The licenses will be available from SynOptics.

SynOptics Communications Inc., 4401 Great America Parkway, P.O. Box 58185, Santa Clara, CA 95052-8185; (800) PRO-8023.

# Telebit Communications Server Has Dial In, Dial Out Options

BY DAVID COURSEY

Telebit Corp.'s newly shipping communications server gives remote PC users access to their LAN resources without requiring a dedicated modem for each computer.

The Telebit Asynchronous Communications Server (ACS) also provides modem pooling for outgoing calls and

includes both remote control and communications software, the company said.

The communications server elevates dial-up telephone connections to the level of tools that "corporate MIS managers expect," said Bill Botti, general manager of Telebit's communications products division.

Dynamic allocation of serial ports and the modems or other port-attached de-

vices make this possible. As a result, no modems are inaccessible to network users unless they are really in use. Other servers, notably Novell's, sometimes dedicate a modem to a specific machine. This prevents a user from reallocating the modem for another use on the fly.

The Telebit ACS uses a modem to answer the phone line and then offers callers the ability to connect to any machine running remote control software, Botti said. By breaking the linkage to a specific machine, Telebit allows a group of modems to serve a much larger number of users.

The workstation-modem link on other servers limits the number of users who can access their machines remotely to the total number of modems on the network, tying them all up whether or not dial-in remote control sessions are taking place, Botti said.

The eight-port ISA version of the Telebit ACS is available now for \$3,995. A 16-port Micro Channel model is \$5,995. Both include LAN license agreements for DMA Inc.'s pcAnywhere IV/LAN and Digital Communications Associates Inc.'s Crosstalk Mk. 4. The boards install in AT-class machines which become dedicated servers. Modems are not included.

ACS supports AristoSoft LANtastic, Banyan Vines, DCA/10Net, Microsoft LAN Manager, and Novell NetWare.

Each ACS port can operate at speeds up to 57,600 bits per second. The server also supports three times as many ports per server as the closest competitor: 32 for ISA and 48 for Micro Channel bus machines.

Telebit Corp., 1315 Chesapeake Terrace, Sunnyvale, CA 94089; (800) EBIT.

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## GraceLAN's Latest Refurbishment Lets LAN Managers Track System 7 Resources

BY YVONNE LEE

It ain't nothin' but a System 7-savvy network administration package, monitoring LANs all the time.

Technology Works' GraceLAN 2.0 gathers information about equipment on an AppleTalk network, allowing managers to maintain an inventory, oversee software upgrades, and manage software incompatibilities.

Version 2.0 shows hardware information for running Macintosh System 7 including memory, memory management units, and 32-bit mode capability. It also shows an application's System 7 readiness — whether it is 32-bit clean and supports AppleEvents.

GraceLAN provides detailed information about Macintoshes, PCs, software, routers, printers, and other peripherals on

the network without user intervention. It displays the information in list mode or in a graphical topology chart.

The new version offers enhanced exporting to ASCII. Managers can export entire reports specific fields, and they can export data immediately or request a timed export from 30 minutes to 7 hours later.

The program includes a Claris File-Maker template and Microsoft Excel macros to manipulate data gathered from GraceLAN inside other programs. GraceLAN 2.0, available June 3, costs \$495 for 50 users. The unlimited-user version is \$1,195. Current GraceLAN users can upgrade to Version 2.0, for 50 users, at a cost of \$195.

Technology Works, 4030 Braker Lane W., Suite 350, Austin, TX 78759; (512) 794-8533.

## Windows Communications Lag Behind Hayes ESP

BY DAVID COURSEY

Microsoft Windows 3.0 cuts by as much as two-thirds the potential throughput of modems connected to Hayes Microcomputer Products Inc.'s Enhanced Serial Port (ESP).

The \$299 ESP board was introduced last year as a solution to the problem of data "overrun," said company president Dennis Hayes. Data overrun occurs when the modem speed outpaces the PC's serial port, causing data to be lost.

Under Windows, overrun often takes place on 9,600-bit-per-second (bps) connections, Hayes said. Some Windows users have experienced data loss at speeds as low as 2,400 bps when a processor-intensive application was being run while communications were taking place.

The ESP board, by replacing the PC's serial ports with a coprocessor and two ports of its own, was designed to provide error-free communications at speeds up to 38,400 bps, Hayes said.

Though such speeds are common with DOS communications programs supporting the ESP card, a problem with Micro-

soft's Windows 3.0 throttles communications back to 12,000 to 19,200 bps when the graphical environment is used.

Despite the problem, the Hayes hardware still provides significant benefit to the Windows user, but not as great as its potential, said Rich Abel, Microsoft group product manager. Microsoft plans to remove the data bottleneck in the next Windows release, due sometime this year, Abel said.

The problem exists because Windows moves data to the serial port a byte at a time, rather than in the large blocks of data used by ESP, said Hayes chief scientist John Copeland. ESP-compliant Windows applications don't lose data, but they don't move it as quickly as users expect, he said.

DCA's Crosstalk for Windows and Future Soft Engineering Inc.'s DynaComm are the only Windows programs that now support ESP.

The board is the first implementation of Hayes' Enhanced Serial Interface, which the company placed in the public domain so other ESI boards could be developed. Applications that support the ESP board would also support any ESI-compliant hardware.

# Introducing Fastback Plus 3.0

Users will  
automatically  
like it.



You should like it; after all, your suggestions helped design it. But we didn't stop there. After we made improvements you asked for, like a new windows-style interface, we added plenty of others.

- An archiving feature that erases unwanted files after backup
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- Increased data compression to a full 80 percent, 15% more than version 2.1
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- dBase III-compatible history file database lets you search for and restore specific files
- Backup support for "Bindery and Trustee" files on Novell Netware 286/386

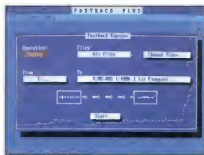
And like all Fifth Generation products, Fastback Plus 3.0 is automatically covered by a one-year, money-back guarantee. Upgrade now for only \$49 and get FREE overnight delivery\*. Just mail or fax the attached reply card with your payment to the address or fax number below. Or call us toll-free.

This offer is limited to Fastback or Fastback Plus users with a valid program serial number.

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will like it because  
it's automatic.

If you're not backing up regularly, you either don't have the right backup program, or you don't have one at all. Fastback Plus 3.0 solves both problems with an entire program full of time and effort-saving features that make backing up so automatic, you can literally do it in your sleep.

- Scheduler and macro recorder for fully-automated, unattended backups



The new fast, simple Express Menu.

- Macro editor in plain English instead of DOS commands
- Optional password protection with DES file encryption capability
- New easy-to-use, windows-style interface with Express Menu
- Advanced error correction

for recovering data from damaged disks

And these are just a few of Fastback Plus 3.0's new features. Now more than ever, there's really no excuse not to back up your data. Because if you don't want to do it, this program will do it for you. Automatically. For more about Fastback Plus 3.0, call the toll-free number below.



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# NETWARE SOLVES ISSUES AT



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# ENVIRONMENTAL THE EPA.

There are many environmental concerns at the EPA. But thanks to NetWare,<sup>®</sup> dissimilar computing environments are no longer an issue.

That's because the EPA chose NetWare to connect a wide range of computers into its 5,000 node, wide-area network. "NetWare lets us integrate DOS, Macintosh, OS/2 and mainframe environments," says Steve Stoneman, manager of LAN systems support.

But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

Fact is, NetWare is compatible with more applications and hardware than any other network operating system. Which makes software incompatibility and equipment obsolescence things of the past.

So call 1-800-LANKIND for your NetWare Buyer's Guide. And learn why the agency in charge of protecting our environment chose NetWare for theirs.



The Past, Present, and Future  
of Network Computing.

## MicroPhone II Update Supports Apple System 7

BY LOUISE FICKEL

Software Ventures Corp. has enhanced MicroPhone II with support for Apple System 7.

MicroPhone II provides front ends to electronic mail packages, data retrieval services, and databases. It also allows users to develop their own front ends to internal E-mail systems and bulletin board systems (BBSes).

Support for System 7's Publish and Subscribe feature means that an E-mail application will no longer require special-X commands, similar to those provided by CE Software and Microsoft, to get retrieved data into messages, said Leon-

ard Rosenthal, programmer at Software Ventures.

Other System 7 features which Version 4.0 will support are AppleEvents, Aliases, the Connection Manager of the Communications Toolbox, and HyperCard 2.0.

Software Ventures started talking last week with Dow Vision, the Dow Jones news-on-line retrieval service, about developing a front end for the Mac, PC, and Next machine, said Sylvia Paull, director of marketing and sales at Software Ventures. The front end would allow users to automatically dial up the service, download stock quotes, and save them to a file. The company has not decided if

the application would be bundled with a later version of the software or sold separately.

MicroPhone II 4.0 will sell for \$295. Current users who purchased MicroPhone II after February 5 will be able to upgrade at no cost. All other current users will have to pay between \$50 and \$70 for the upgrade.

The company revised the shipping schedule last week: The Windows version is now slated to ship in mid-July; the Mac version in mid-August; and the Next version in early September.

Software Ventures Corp., 2907 Claremont Ave., Berkeley, CA 94705; (415) 644-3232.

Continued From Page 43

### ANNOUNCED

## Communications Research Has Blast

Blast PC Plus LAN 10.5.1 is the newest version of the company's communications software for LAN users. Available for all NetBIOS LANs, NetWare NAS, NACS, and IPX, AT&T StarLAN, and other networks, the new version provides remote control, terminal emulation, scripting, file transfer, and other features. A single-user license is \$349, a four-user license is \$995, and an eight-user license is \$1,495. A special \$99 price is available for users of other remote-control LAN products. Shipments are scheduled to begin next month. The software is also available for Macintosh, mini, and mainframe environments. (800) 24-BLAST.

Arnet Corp. introduced two communications products at spring Comdex. The SmartPort Plus, \$695, is an eight-port RS-422 serial expansion board. The ClusterPort/5 is a cluster controller which supports up to 128 users through a single expansion slot. A sin-

gle host PC can be outfitted with up to four boards, supporting as many as 512 users. Pricing for a 16-port version of the board starts at \$2,295. Shipments of both products are scheduled to begin in July. (615) 834-8000.

Triton Technologies' debuted two new versions of its CO/Session remote control software at spring Comdex. CO/Session LAN II for Novell Networks, priced at \$495 per server, is scheduled to ship September 1. Windows support across the network will be provided. The CO/Session ACS, shipping in August, provides modem sharing and communications features to users of Novell and NetBios networks. A one-modem version is \$295, and a two-modem edition is \$395. (201) 855-9440.

Computone Corp. announced at Comdex its IntelliPort II EX, a controller that improves performance of multiuser systems while solving the problem of how to hide cables for as many as 64 attached terminals, modems, printers, or other devices. The controller attaches to the host via a single-slot ISA, EISA, or MCA adapter card. Scheduled to ship in July,

## SoftSwitch Announces Fax and Telex E-Mail Gateways

Electronic mail users connected to a SoftSwitch mail backbone will now have gateway access to fax and telex services.

This means they will no longer have to know whether intended recipients of their messages have E-mail capabilities, according to SoftSwitch Inc. officials.

Both the fax and telex gate-

ways provide tracking and control features, and both can be scaled to support either single-line or multiline systems. Addressing is directory-based, and users will have the option of placing fax and telex numbers directly in their messages.

Scheduled to ship in the third quarter, the gateways will initially be available for environments

that support IBM's VM operating system.

List price for the Enterprise Fax Gateway/VM begins at \$32,000; the cost of the Enterprise Telex Gateway/VM starts at \$30,000.

SoftSwitch Inc., 640 Lee Road, Wayne, PA 19087-5698; (215) 640-9600.

— Louise Fickel

# Oh, what a twist

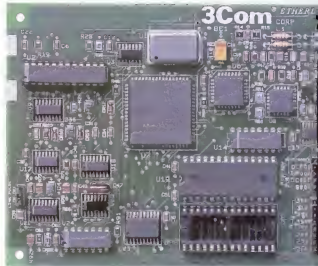
Getting ahead in a twisted world is easier than you think.

All it takes is a little help from EtherLink® 10BASE-T network adapter boards. They're designed to make working with your twisted pair hubs flexible and simple.

EtherLink 10BASE-T products work with both shielded and unshielded twisted pair, for example, and can accommodate different wire gauges and impedances.

What's more, they come ready to work with pre-10BASE-T hubs as well: SynOptics, AT&T, Hewlett-Packard and David Systems.

They even push your transmission up to 75 percent farther if you use 3Com® MultiConnect® Repeaters. Farther than the maximum distance required by the IEEE standard.



the eight-port version is \$795; the 16-port model is \$1,895. External concentrators are used to expand capacity, at \$795 per eight ports or \$1,095 per 16 ports. (800) 241-3946.

#### SHIPPING

### Alcom Releases Router Software

Alcom Corp. released a software module that automatically routes incoming faxes to recipients' E-mail boxes or to a printer. The LanFax Gateway Inbound Router supports both Direct Inward Dialing (DID) and Dual Tone Multifrequencies (DTMF), depending on the fax card. The LanFax Gateway Inbound Router costs \$3,295. (415) 493-3800.

Eicon Technology announced at Comdex new versions of its SNA Gateway software product family for LANs and stand-alone DOS and OS/2 systems. The SNA LAN Gateway provides 3270, 5250, and LU 6.2 communications across a LAN and sells for \$795. The stand-alone gateways, \$195, provide the same functionality in a single-user environment. The software uses the company's

EiconCard intelligent communications adapter. All of the products are now available. (514) 631-2592.

**Network Resources Corp.** is shipping MacFTP, a file transfer application for the Macintosh. Based on the File Transfer Protocol (FTP) of TCP/IP, MacFTP runs on top of Apple's MacTCP, allowing Mac users to transfer files with Sun, DEC, and Unix users. MacFTP requires 380K of memory, runs on any Mac from the \$12K on up, and is fully compatible with System 7. Available now, single copies sell for \$95, 10-user packs for \$895, and 100-user packs for \$8,250. Site licenses are also available. (408) 263-8100.

#### UPGRADES

### Trellis Updates TimeTalk Program

Trellis is shipping an upgrade to TimeTalk with an enhanced meeting scheduler. The new version automatically selects the first available free time slot for all attendees. It also includes printouts of weekly appointments and to-do lists. TimeTalk costs \$1,495 per server. (508) 435-3066.

## NCR Expands WaveLAN Product Line

MCA Version of High-Speed Wireless LAN to Ship in Third Quarter

BY LOUISE FICKEL

NCR Corp. last week spread its wireless influence a little farther with a Micro Channel Architecture version of its WaveLAN high-speed wireless LAN.

WaveLAN transmits data over the unregulated 915-MHz spread-spectrum transmission band at speeds of 2 megabytes per second. It comes with a wireless LAN network interface card, an integrated radio transceiver, and software for Micro Channel and AT-compatible

PCs.

In a typical office setting, WaveLAN can send data over an area of 50,000 square feet to an unlimited number of PCs, according to NCR.

WaveLAN is compatible with Novell NetWare 2.X and 3.X, Microsoft LAN Manager, 3Com 3+Open, IBM LAN Server, and TCP/IP.

Equipment available for use with the MCA version of WaveLAN includes an antenna that transmits data for up to five miles and sells for \$1,995; a

Data Encryption Standard (DES) security feature that is priced at \$90; and Boot ROMs for NetWare 2.X and 3.X, and LAN Manager, which are priced at \$45. The add-on products will be available in the third quarter.

Scheduled to ship in the third quarter, the Micro Channel version will sell for \$1,390. That price includes drivers for NetWare 2.X and 3.X, and LAN Manager.

NCR Corp.; 1700 S. Patterson Blvd., Dayton, OH 45479; (513) 297-5700.

## Lap2Lan Connects Laptops to Network

Laptops can be brought into the network fold without requiring a network adapter, thanks to a product demonstrated at spring Comdex last week.

Lap2Lan connects the laptop to the parallel port of a networked PC. The software allows the desktop PC and the laptop to function as totally separate nodes on the network.

The memory-resident pro-

gram can also connect multiple PCs to the network. Network technicians can daisy-chain up to six PCs to a single node.

Lap2Lan connects to NetWare or NetBIOS networks running over Ethernet, token ring, and Arcnet.

A parallel connection cable is included with the \$149 software, but the program can also connect over serial ports. Parallel

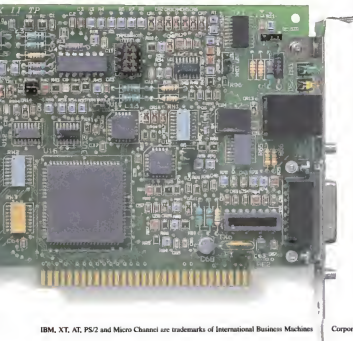
communication runs at up to 50 kilobits per second.

Lap2Lan was developed by East Coast Software of Ireland, and can be purchased through the Trachtman Group in the United States.

The Trachtman Group, 2300 Peachford Road, Suite 1150, Atlanta, GA 30338; (404) 455-9200.

— Yvonne Lee

# ted life it leads.



Of course, EtherLink 10BASE-T adapters are compatible with your hardware. And you can use them with virtually all software on your network. For IBM PC, XT, or AT there's EtherLink II® TP. For Micro Channel PS/2 models there's EtherLink/MC TP.

And both are backed by a lifetime warranty.

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to more types of systems.™

## MACINTOSH NEWS

## PIPELINE

## SHIPPING

## CMS 3.0 Shipping From Softouch

Softouch Software Inc. is shipping Cost Management System 3.0, a \$289 application for cost estimating and job packaging, which includes a run-time version of the Foxbase+/Mac database. A site-license version of the software is available for \$995. (800) 829-1841.

**Breakthrough Productions** has released Market Master for the Macintosh, Version 3.0. The software runs on top of Odesta Corp.'s Double Helix database. Market Master is priced from \$395 for a single-user version, to \$1,995 for a complete sales force. (916) 265-0911.

## BUNDLES

## Grammar Added to Claris MacWrite

Claris Corp. will start bundling WordStar International Inc.'s Correct Grammar 2.0 with MacWrite II. Everyone who purchases a copy of Claris' word processing application will receive Correct Grammar for free. The grammar checker sells for \$99 as a stand-alone application. (415) 382-8000.

## UPGRADES

## GeoQuery, Acius to Link With Mac

GeoQuery Corp. and Acius/Alcius have agreed to jointly develop links between GeoQuery's GeoQuery business mapping package and Acius' Fourth Dimension database, using Apple's System 7 Interapplication Communication technology. A new version of GeoQuery supporting Fourth Dimension is expected to ship later this year.

**Tecmar Corp.** has introduced a System 7-aware version of its Macintosh disk backup software for the Macintosh. (800) 624-8560.

**Peatree Software** has announced that upgrades for its AtOnce and Insight Expert accounting series for Macintosh computers will include compatibility with Apple's System 7 operating system. (404) 876-4482.

## Adapter Cards Piggyback For the Mac IIs, SE/30

BY YVONNE LEE

Numerous vendors have devised piggyback adapter cards for the Macintosh IIs and SE/30, enabling users to plug in more than one card in these single-slot machines.

"Even though Apple restricted those [machines] to one port, there's enough power there to put in at least two boards," said Ron Yolmar, vice president of sales and distribution at Asante Technologies.

Sonic Systems Inc. has introduced Ethernet adapters that allow other processor direct slot (PDS) cards to attach to it. It has upgradeable static RAM on board, as well as a socket for floating-point unit.

This gives Mac IIs and SE/30 owners Ethernet connectivity, while allowing them to use other expansion cards.

The \$299 card is available now. The floating-point unit is \$99.

Radius also developed a sim-

ilar video card allowing network adapters to run piggyback without modification.

The \$795 Radius Color Pivot IIs Interface card is an 8-bit adapter displaying 256 colors and 256 shades of gray. It supports all Radius full-page displays.

The Radius Color Pivot IIs Interface card runs on the Mac IIs only.

The Radius cards work with any cards fitting the processor direct slot, but Asante Technologies is marketing a \$379 Ethernet adapter specifically for the Radius card. Any PDS Ethernet card that offers a DB-15 or DB-9 port, as the Asante does, can pass through the Radius card, according to officials at Radius.

Radius Inc., 1710 Fortune Drive, San Jose, CA 95131; (408) 434-1010.

Sonic Systems Inc., 2121 Rainbow Drive, Cupertino, CA 95014; (408) 725-1400.

Asante Technologies Inc., 405 Tasman Drive, Sunnyvale, CA 94089; (408) 734-4844.

## Radius Taps Into Kodak's Color Publishing System

BY KRISTI COALE

Radius Inc.'s color display systems will become a standard part of Eastman Kodak Electronic Printing Systems Inc.'s Prophesy Color Publishing Sys-

tem, the company announced last week.

The agreement gives the Macintosh display developer a hook into the Mac sales, which accompany Kodak's Unix-based publishing system.

For every Prophesy system, there are at least three or four Macs that go along with it," said Terry Bailey, Radius' color products manager.

Prophesy is a high-resolution color publishing system, with Unix workstations acting as servers for such tasks as color separations and other processor- and memory-intensive operations. Macs act as the interface through which users design and construct documents on this PostScript-based system.

Central to this system is a color calibration scheme, with Radius' Professional Color Toolkit becoming a key component of the Kodak Color Publishing System (KCMS). It will be supported by Radius' current color products, as well as future technologies.

Among the products Kodak will be endorsing for use with Prophesy are all Radius color displays, the Radius QuickColor Graphics Engine, and the Precision Color Calibrator.



Claris Corp.'s MacWrite Pro is one of a number of future products designed to exploit the advanced features of Apple's System 7.

## MARKET UPDATE

## System 7: Compliance Now, Not Functionality

Vendors Get Behind OS, but It Takes Time

BY KRISTI COALE

Macintosh graphics and publishing applications users can expect to be up and running most of System 7's core technologies soon. They may, however, encounter some hitches as vendors are promising compliance now, with an eye toward full compatibility in the coming months.

Part of the problem is Apple's definition of compatibility. Users have to wait through compatible products (those that run under System 7 without taking advantage of the features), mostly compatible products (they run, but with minor problems), and incompatible products before getting to System 7-aware software.

**ADOBE IN THE LINEUP.** Adobe Systems Inc.'s suite of graphics and typography applications including Illustrator, Version 3.0.1, Streamline 2.0, and Type-Align 1.0.4 will run under the new Mac OS. The company expects to have fully compatible versions for all products by the end of the year.

PhotoShop 1.0.7, which will take advantage of all System 7 features, is expected out by the end of the summer.

Users installing such programs as Adobe Type Manager (ATM) for the first time under System 7 will have to work around some niceties to enable the application.

In the case of fonts, System 7 frees users of the shackles of Font/DA Mover; they can now copy the fonts into the System Folder, and the Mac OS takes care of putting them in a folder for use by applications. □

ATM cannot access these "nested" fonts; it needs them loose in the System folder. A version of ATM will adhere to System 7's font access scheme by year end, according to Adobe.

Pricing for these upgrades has yet to be determined. Adobe users can call (800) 233-0078 for more information.

Aldus Corp. is offering users a similar fare for its applications running on System 7.

Right now, users of PageMaker 4.01, FreeHand 3.0, Persuasion 1.0, PrePrint 1.0, SuperCard 1.5, Personal Press 1.01, Digital Darkroom 2.0, SuperPaint 2.0a, and Super 3D 1.2 are told they have compatible applications, but the company has yet to announce specific plans for release dates and prices of System 7 upgrades.

Ventura Software Inc. is currently working on Version 3.0.2 of its page layout program, which will take advantage of such System 7 core technologies as Publish, Subscribe, and Balloon Help.

Ventura cannot guarantee the compatibility of either 3.0 or 3.0.1 with System 7, but the company said that 3.0.2 is expected out in August.

**DENEBA IS READY FOR SYSTEM 7 ACTION.** Canvas 3.0 from Denbe Software is jumping out of the starting blocks on using AppleEvents.

The \$399 illustration package is set to ship next month and will take advantage of Interapplication Communication (IAC) and, well, with Articulate Systems' Voice Navigator II, enable users to draw shapes by voice command. □

## Will It Work With System 7.0?

Part Three

**Compatible Products**  
 Graphics 2.4  
 Night Watch Admin. 1.03  
 Prodigy 1.5  
 QuickCAD 2.1

**Mostly Compatible Products**  
 Notebook 1.0.1  
 PrePrint 1.0

**Incompatible Products**  
 NetSwitch  
 On Cue  
 PCSession Prep  
 QuickKeys 2

SOURCE: APPLE COMPUTER

Mostly compatible products might have some problems under System 7, and incompatible software doesn't run.

# InfoWorld readers vote Northgate "Desktop Computer of the Year!"

## Northgate Shatters Ten Years Of IBM, Compaq And Apple Dominance!



**I**nfoWorld readers are the "Who's Who" of Corporate America's most knowledgeable computer buyers. For the past decade, InfoWorld has sent ballots asking readers to vote for their choice of "Desktop Computer of the Year." Only one wins. Apple, IBM and Compaq have dominated this voting.

### But for 1990, a real shocker!

When the tens of thousands of votes were tallied neither Apple, IBM nor Compaq had won. Nor had Dell, AST or Hewlett Packard. Instead, InfoWorld's readers voted a Northgate system "Desktop Computer of the Year."

### With this landmark vote, one era ended and a new one began!

Northgate, a four-year-old computer designer and manufacturer from the Midwest toppled tradition and along with it, the way corporate computer buyers do business. Because Northgate doesn't sell just ordinary computers and we don't sell them in a traditional way.

Northgate designs and builds the industry's highest performing systems. And we sell them directly to you. No dealers. Does this method work? You bet it does...

*The top experts in thousands of America's largest businesses voted on it. And in one sweep, corporate computer buyers have declared:*

### It's safe to buy from other than IBM and Compaq...

*And now it's safe to buy high performance computers from a company that sells directly to the customer!*

How did all this happen? Well, we could say it's a result of our years-ahead design. Performance that has won just about every other award in the industry. And legendary technical support and customer service policies that demand we deliver total satisfaction. A winning combination, indeed. But what matters most is...

### Northgate goes the extra mile to assure your computer dollars are investments, not costs!

It's the Northgate differences that create customer confidence! When sophisticated buyers, like the readers of InfoWorld, put pen to purchase order, Northgate gets the vote. They know they can trust Northgate.

At Northgate, components are researched and evaluated under the most stringent methods to ensure highest

performance, compatibility and reliability. Every system we sell has gone through at least 547 individual compatibility checks (315 software programs alone) before our quality control engineers say it's Northgate.

That's one of the reasons Northgate systems work so well. From our economical SimLine® systems, right up through our spectacular 486/33, winner of the InfoWorld "Desktop Computer of the Year" voting, you can be sure when you buy Northgate you're putting a winner to work.

Northgate gives you the edge in today's tough marketplace. But that's not enough...

### Half a million minutes a year Northgate technical support is ready for your call!

When you buy IBM or most other computer brands from a dealer, you live with their support policies. At best they're open 9-5, and maybe a few hours on the weekend. Need to talk to someone "off hours"? When you deal with those guys, you're out of luck. No support. No help.

At Northgate, there's a friendly, understanding and superbly capable tech specialist ready to help you 24 hours a day, seven days a week.

### Let's see IBM and Compaq match this offer...

We invite your company to enjoy the Northgate experience. Put our systems to the test for 30 days. If they don't deliver everything you expect — and more — we'll buy them back. No strings attached. Simply call our 800 number for a free Pre-Purchase Consultation with one of our account representatives.

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Elegance 385/25



Elegance 386/33



Elegance 486/25

## INDUSTRY

## PIPELINE

## PERSONNEL

## 3Com Names Network Manager

3Com Corp. has appointed Alan Kessler general manager of the network systems division. 3Com president and CEO Eric Benhamou had held the position since the division's inception in October 1990. Kessler, formerly vice president of the company's distributed systems division, will now lead the division responsible for internetworking products, wiring hubs, and terminal servers, the company said.

## MERGERS

## BizMart Bought by IE Chain

Intelligent Electronics Inc. recently acquired BizMart Inc., a Dallas-based 57-store chain of office product centers, for \$192 million in cash. The purchase, which brings IE's total number of stores to more than 1,058, better positions it to compete with CompUSA, another large retailer.

## FINANCIALS

## Micrografx Has Record Sales Year

Windows developer Micrografx Inc. reported record sales of \$29.5 million for the fiscal year ended March 31, a jump of 60 percent compared to the previous year. The Richardson, Texas, firm had earnings of \$4.1 million, a 200 percent gain over last year's \$1.3 million. Fourth-quarter sales were \$8.4 million, compared with \$5.6 million for the same fiscal period last year. Earnings for the last quarter were up 61 percent to \$1.2 million compared with \$750,000 last year.

## ALLIANCES

## U.S. Semiconductor Industry Regroups

After persistent setbacks, the U.S. semiconductor industry last week adopted a new model for improving performance, according to Ernst & Young, a market research firm. The semiconductor industry intends to place great emphasis on high-value markets, customer-oriented products, and strategic alliances.

## Intel Reshuffles, Key Personnel Are Reorganized

Intel Corp. has recently dissolved its microcomputer components group, shifting Dave House — Intel's senior vice president and the group's former president — into a new leadership role.

House will head the architecture and applications group. The reorganization shifts House's focus to key X86 microprocessor architecture development rather than day-to-day operations, said Intel officials.

The other newly formed groups include the software technology group, to be led by Intel vice president Ron Whittier, and the multimedia and supercomputing components group headed by Ken Fine, a general manager at Intel. All three groups will report to Intel's executive office.

In addition, the restructuring



David House heads Intel's new architecture and applications group after a restructuring.

produced a handful of new groups: the products group (formerly systems); the microprocessor group that focuses on 386DXes and 486s; the entry-level products group that has the 386SX and SL products; the semiconductor products group that deals with microcontrollers and EPROMs; and the technical and manufacturing group that centralizes companywide microprocessor manufacturing.

— Louise Fickel

## Suit Alleges Compaq's Health Misrepresented

BY LISA PICARILE

A class action suit filed last week against Compaq Computer Corp. by two shareholders alleges that top company officials deliberately made false or misleading statements regarding the company's financial health. The charges come after the Houston-based PC giant's stock dipped 13 1/4 points.

The suit, filed by Jacob Moskowitz and Ronald Coerner, is based on public statements made by Compaq president and CEO Rod Canion, as well as Benjamin Rosen, Compaq's chairman of the board.

Moskowitz and Coerner allege that many optimistic statements made by Compaq executives prompted them to invest in the company.

Moskowitz bought 100 shares at \$67.75 per share on

March 14. Coerner, acting on the behalf of Defined Benefit Pension Plan No. 1, purchased 100 shares at \$67 on March 20.

The plaintiffs cited several instances, dating back to December of last year, in which Canion spoke about continued growth of foreign markets, gaining of market share, and the future of Systempro.

The plaintiffs claim that Compaq painted a rosier picture than was true.

Although the investments of the two plaintiffs were relatively small, it is not uncommon for legal action to be sought after a company's stock takes a nosedive, according to industry observers.

Last month Apple Computer Inc. had a similar class action suit filed against it by a shareholder when the company's stock suddenly dropped.

## Dealers Battle Against Anti-Channel Portrayal

## Vow Not to Take 'Channelcide' Lying Down

BY DAVID COURSEY

Computer retailers say "channelcide" — attacks by mail-order houses on the quality of service provided by dealers — has damaged their reputations, and last week at spring Comdex they vowed to fight back.

ABCD: The Microcomputer Industry Association, a group representing retail computer dealers, announced it has collected \$1 million for the cause from Compaq Computer Corp., Apple Computer Inc., and NEC Technologies, as well as dealer chains Inacom Computer Centers Inc. and MicroAge Computer Stores Inc.

"There's a crime going on, it's channelcide," said Rick Inatome, chairman and chief executive of Inacom. Dealers have been victimized by advertising that portrays them as inept and overpriced, he said.

The plan is to persuade customers that most dealers do a good job of meeting end-user needs, and have greater capabilities than mail-order companies, said John Venator, executive

vice president of the 2,500 member group.

In addition to buying advertising in general business and end-user publications, ABCD is also commissioning research to determine how end-users at small companies feel about their dealers.

Current customer perception is that specialists are good and retailers are bad. Inacom purchased a network consulting business, in Atlanta, merged it with the local Inacom stores, and saw sales fall sharply. About the same time Inacom also spun off its Chicago networking specialists into a separate company and experienced a 300 percent sales growth.

Service-oriented dealers are better able to match customer needs to applications and hardware, said MicroAge chairman Alan Reid.

"Fundamentally, the channel is changing," said Apple vice president Cliff Jenks. The difference between low- and high-end dealers is increasing, especially with the entry of superstores and mass-market retailers.

## MARKET ANALYSIS

## DEC's Hot Boxes Have Got Muscle, But Need Support

BY BARBARA DARROW

Digital Equipment Corp.'s hot new boxes may not improve the company's lukewarm image in the PC market unless the company provides equally impressive marketing and support, analysts said.

DEC hopes the aggressive pricing of its recently introduced 486-based DECpc 433 will help the company make up for lost time. The base unit — offering 27-million-instruction-per-second (MIPS) performance, 8 megabytes of RAM, and a video controller — lists for \$5,999, which should rival Compaq Computer Corp.'s systems and lower priced PCs.

"They've aggressively priced capable machines, so the question is whether DEC can compete with people like Dell," said Michael Gouldie, an analyst with Open Systems Advisor of Boston. DEC has to match Dell's level of support and customer service without boosting prices, he said.

Digital is working with its service support centers to develop a mechanism for supporting low-end product, the company said. It won't be easy, but at least they understand the concept, whereas some of the other players are clueless, said an analyst.

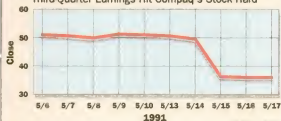
DEC is also trying to reel in potential users, expanding mail direct mail and telemarketing operations, said Grant Saviers, vice president of DEC's personal computing systems and peripherals group.

The new machines are expected to have broad appeal. Positioned as network nodes, the base diskless model comes with either an Ethernet or token ring interface built into the motherboard. This should attract users implementing DEC's Network Application Support (NAS) enterprise-wide application integration scheme.

DEC's boxes will run standard PC applications and sport a graphics board that boosts the resolution of VGA applications while increasing their performance. □

## Compaq Stock Activity

Third-Quarter Earnings Hit Compaq's Stock Hard



## TECH STREET • BY JOHN GANTZ



## How Dark Are the Stock-Price Clouds Looming Over Compaq?

ago that its second-quarter earnings would be a fraction of what they were a year ago and that revenues would be down 15 percent since the market into a tailspin. The Dow Jones Industrial Average — of which Compaq is not a component — fell 21 points, and other high-tech oriented averages fell even further.

Compaq lost 25 percent of its market value in a single day, May 16. On that day Compaq was the most actively traded stock on all the exchanges, and for the week it was the second most active stock on the NYSE. Within a day or two, though, the market was back up, and then down, and then up, etc. It forgot about Compaq and moved on to other worries, such as interest rates and balance of trade payments. Unfortunately, when the market moved up, it didn't forget Compaq with it. It closed the week 15 points lower than when it had started.

The problem with Compaq is that Compaq isn't the problem. It's about as good a company as you can find. Good technology, good management, good financial position, and a strong position in the market. It's a winner company, but the universe has changed within the last year or so — at least fundamentally.

At various times I've highlighted these

changes in this column, but let's take another look at them.

- High-tech stocks are overheated.

- Budgets are down. The economic recession in the outside world seems to be magnified in the information systems sector. Surveys by TFS indicate that not only are MIS budgets down this year from last, but they're still being cut. Projects are being put on hold, budget sign-offs lowered, and major application development projects for less.

- The PC is a commodity. Windows notwithstanding, the MS-DOS personal computer is now about as standard as the copy machine. Even low-quality, low-price machines are pretty good, meaning Compaq's differentiation as a high-quality PC innovator counts for less.

- Distribution channels are changing. To begin with, two-tier pricing, which rewards volume buyers, has fostered aggregators, bulk purchasers, and nationwide chains. But now that everybody is aligned in a volume-buying group of one kind or another, the volume advantage is gone. It's back to dog eat dog in the channel.

Compaq believes that one reason its revenues are down is the state of recent mergers in the channel that has led to inventory consolidations. And we don't help that Compaq's biggest dealer, Businessland — which which it broke up and then reunited over the last 18 months — is on the verge of Chapter 11.

- Competition is more intense than

ever. If a new player like Packard Bell can grow to \$500 to \$700 million in size selling PCs, monitors, and printers, you know something weird is going on in the market. The odd thing is that most of Packard Bell's buyers probably don't remember when the market was associated with high-quality radios.

- The PC is being used increasingly in enterprise-wide applications in which companies such as Digital Equipment Corp., AT&T/MCR, and IBM have a selling advantage. The Compaq Systempro could be the world's best server, but for Compaq to get its current dealer and VAR channel up to speed on how to sell into a new corporate decision-making milieu is going to take time and will be difficult.

Compaq knows this, but it has little choice — other than attempting something radical like a merger — but to try. Its play with Silicon Graphics and its membership in the Advanced Computing Environment (ACE) initiative is at once both an investment in future markets and an admission that the company can't move into new realms on its own.

We've watched Compaq for many years, marking its passage first to a \$1 billion company and then to a \$2 billion company in these pages. And we've seen its stock price take a beating before. The company rescued itself the first time when it took a gamble with the 386-based Deskpro, announcing it ahead of IBM, which was an unusual tactic for a clone

company. And its announcement of the Compaq Lite was one of the reasons the company had a banner year in 1990 — late entrance into laptops that it was.

It's just that this time it's hard to see exactly what Compaq can do to extricate itself from its current situation. If it were just an earnings problem, Compaq could solve it with belt tightening. But it's also a revenue problem, and that's more serious. Compaq's going to have to design and then sell its way out of this corner.

Here's where Compaq's breeding and gene pool will come in. The company is both smart and tough. It knows how to handle tough times, how to read the market, and its executives keep in close contact with the market. If you had the market, you'd love to hire the Compaq team.

So I'd say that Compaq will come roaring back within 18 months, once the channels settle down, Systempro sales pick up, the economy improves, and competitors start to shoot themselves in the foot. I don't know when its stock will bottom out, but I can't believe Compaq won't recover a lot of lost ground over the next year. As a matter of fact, I wouldn't be surprised if a little more analysis and a little more time wouldn't allow one to make a case that now's a time to buy.

John Gantz is editor of Tech Street Journal, which covers the high-tech stock market and business performance. The views expressed are his own.

## STATE OF THE INDUSTRY • BY RACHEL PARKER

## Apple, Compaq Prepare to Weather the PC Market Storm



The dinosaur stands in front of a podium, addressing a crowd of reptiles sitting in the audience. A typical business meeting in the Pleistocene Era, I suppose.

"I have some bad news," the CEO brontosaurus tells his minions. "The climate is changing, the mammals are getting smarter, and we have brains the size of walnuts!"

While their situation isn't quite that serious, it wouldn't surprise me if that *Far Side* cartoon is being posted on a few Compaq or Apple bulletin boards these days. Neither Compaq nor Apple literally faces extinction, but the climate in the PC industry is certainly changing.

Competitors that Rod Cansion's team could have crushed — or blithely ignored — a few years ago have gotten much smarter. Apple clearly faces a threat from Microsoft Windows. Both it and Apple — companies that cut their teeth on high prices and fat margins — have cut prices in recent months. And both companies are having to adjust their overall business strategies to accommodate those lower prices.

Apple at least is driving its own change. The company decided to go for higher volumes at lower prices in order to build overall market share in a slowing PC market. The decision seems to have worked. Apple's unit sales are up, although it is too early to tell if it is gaining

market share.

At the same time, Apple has to move its installed base to System 7. The newly announced operating system fulfills a two-year-old promise the company had made to users of Macintosh computers and has been well received by most observers.

But Apple has burned early adopters before. The company's last major system release was filled with bugs and was incompatible with several major applications. Many buyers are waiting for proof that System 7 will do all it promises to do without causing unexpected grief for information center managers and support personnel.

Compaq, on the other hand, was forced to adapt to the new pricing, making PC prices from clone makers have never really ruffled Compaq's feathers. But this time there is a new wrinkle in the equation: The clone makers are offering the same technical quality and innovation for which Compaq has been known.

The company no longer can say that its systems are worth the extra price in quality. Its Deskpros are facing stiff challenges from ALR, AST, and a growing number of Asian companies that have access to the same components that Compaq uses.

This may be tough all over. Even IBM is lowering prices. With little to offer that the world's other suppliers cannot match, Compaq has been forced to be more cost

competitive.

The warning signals that Compaq and Apple sent to Wall Street about lower profits should not have been surprises to anyone. With less money coming in from each unit sale, the companies' overall profitability will decline.

Of course, Wall Street is known for its mercurial responses to such warning signals. Compaq took an especially tough drubbing, with the stock falling by some 25 percent in a single day.

Despite the dissimilarities, Apple and Compaq are at similar points in their evolution right now. Both companies are on the edge of a new age in the computing business. They must, if they are to survive, figure out how to manage their own growth — to adapt to current market conditions and move into the next stage of their development.

For Compaq, the future must be in higher end systems. The ACE Architecture may have been embraced only half-heartedly by Compaq, but it or some other high-performance platform will be the next place that Compaq engineering can shine.

Apple's direction is less apparent. Many reports have circulated about its intentions to license the operating system to other companies in order to create a larger market for Mac applications software. The company may be turning itself into a Microsoft — providing an operating system that can run on a variety of platforms.

That still leaves many questions unanswered. Where does Apple stand on RISC? And is it prepared to go head-to-head with Microsoft?

Like Compaq, for the short term, Apple's business will be primarily made up of selling lower priced, lower profit systems.

So it will be important for Compaq and Apple to rethink their business plans, and soon. While it is possible for low-margin companies to build costs into a business, it will be harder for a company accustomed to fat margins to trim those costs.

A transition involving the basic spreadsheet of a company is especially painful. Right now, neither company is really in trouble. During the next quarter or two, earnings reports for both will disappoint investors who are used to substantial margins accompanying a steady sales growth. But that is a short-term issue. The larger question will be whether the companies can move into their next era before those slimmer profits take a toll.

With such issues at stake, executives at Apple and Compaq may want to replace the *Far Side* cartoon with Bette Davis' famous line: "Fasten your seatbelts, it's going to be a bumpy ride."

Rachel Parker is InfoWorld's Executive Editor of News. Comments are welcome via MCI Mail (f.i.d. number 340-4371, or InfoWorld) or through traditional mail.

# Never



**Peter Norton**

When it comes to your crucial data, Peter Norton just won't take **C:\FILE NOT FOUND** for an answer. With programs like the Mace Utilities\* and PC Tools\*, data recovery is often mission impossible. But with the Norton Utilities\* 5.0, data recovery is mission *critical*—and it can recover what no other utility can.

*Data Recovery is serious business, which requires serious features. And the Norton Utilities has them all.*

## Norton Does Windows.

The Norton Utilities is *the* safe DOS utility program for use with windowing environments like Windows\*3.0 and DeskView.

Because PC Tools and Mace Utilities are blind to multi-tasking, they can irreversibly damage your files. While the Norton Utilities 5.0 offers three full levels of safety checks under Windows 3.0.



*With a clear vision of the PC's future, the Norton Utilities 5.0 provides safe Windows 3.0 recovery.*

## Norton On Networks.

The Norton Utilities is the *only* utility program that provides file recovery on Novell and DOS-compatible networks. So you can use *File Save* along with *UnErase*\* to recover deleted files,\* or *File Fix*\* to reconstruct Lotus\* 1-2-3\* and dBASE\* files. From any node on the network.

What's more, MIS will appreciate the Norton Utilities' compliance with existing network security restrictions.

*System Information* provides detailed reports on network information and TSR memory allocation, as well as graphical benchmarks of disk, CPU, network, and general computer performance.

*The next best thing to being there is being on the network. And the Norton Utilities 5.0 is the only data recovery tool that is.*



DATA RECOVERY FEATURES	NORTON UTILITIES	PC TOOLS	MACE 1990
Number of DOS Error Messages With On-Line Advice	75	0	0
Different Types Of Data Loss Problems Solved			
File System Corruption	31	12	15
Physical Hard Disk Damage	6	0	0
Internal Data File Damage (i.e. dBASE, Lotus)	10	0	6
Disk Reliability Testing (Number Of Patterns)	80	0	0
System Information (Topics Reported)	94	15	16
NETWORK file recovery <small>*File Save must have been installed prior to data loss.</small>	YES*	NO	NO
WINDOWS Safe Operation	YES	NO	NO
Failsafe Design	YES	NO	NO
Effective File Encryption That Does Not Require You To Change The Way You Work	YES	NO	NO

# Say Die.

Rated #1  
Hard Disk Utility  
InfoWorld 12/10/90

## Norton's Superior Recovery Technology.

The Norton Utilities handles the toughest data recovery situations easily—predicaments other utilities handle poorly, if at all.

*Advise* explains cryptic DOS error messages in plain English so you can understand the problem, and gives specific recommendations on how to fix it. So your valuable data is not at the mercy of risky trial-and-error procedures.

Unlike the competition, Norton recovery procedures are easy to use and completely fail-safe. And because you can UNDO changes, you won't make a bad situation worse. In fact, while using the Norton Utilities your data will even survive a sudden power loss. All in all, it's the safest, most extensive diagnostic and recovery utility available.

And only the Norton Utilities gives you every-

### Norton Utilities 5.0 Adds Features, Improves Interface

"Norton's disk utilities now surpass anything you can find in PC Tools Deluxe or The Mace Utilities, and offer safeguards you can't find anywhere else."  
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10/16/90

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thing you  
need for  
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identifies bad sectors, and even  
repairs demagnetized

areas of your drive.

So get serious about data recovery. See your dealer for the new Norton Utilities 5.0. To upgrade now call 1-800-343-4714 or fill out the coupon below. For more information, call 1-800-343-4714 Ext. 708 (in Canada, 1-800-465-2266). And in the immortal words of Peter Norton, "Never say die."

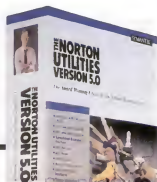
# SYMANTEC.

\$59

### Upgrade Now and Save \$120!

Make Utilities and PC Tools users can now get the Norton Utilities 5.0—list price \$179—for \$59. Just send this coupon to Symantec, along with the title page from your Mace Utilities or PC Tools product manual. Send a check or have us bill your VISA or MasterCard \$59 plus tax and \$5 shipping and handling.

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Exp. Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Day phone (\_\_\_\_) \_\_\_\_\_

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One	<input type="checkbox"/> 5 1/4-inch <input type="checkbox"/> 3 1/2-inch	\$59.00
In these states, add sales tax including applicable local tax: CO 3%; GA, IA, IL, MI, NY 4%; MO 4.225%; IN, MD, MA, OH, WI 5%; DC, FL, MN, PA, CA 6%; IL, TX 6.25%; WA 6.5%; NJ 7%; CT 8%.		
Add shipping and handling:		\$ 5.00
Total:		<input type="text"/>

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Cupertino, CA 95016-1680

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# PERSPECTIVES



## Color Printing Meets the PC

*With a range of forms and price tags, printing in color is finally a possibility.*

BY MARTIN MARSHALL

**C**olor desktop presentation software is here and with it color PC monitors that bring the richness of super high resolution to the screen. But when it comes to moving those presentations off the screen and onto paper, the availability, pricing, and output quality of desktop color printers can be a stumbling block to the all-color desktop publishing environment.

But all that is changing. While few would contend that desktop color printing will match the quality of webbed color offset presses within the foreseeable future, for a large number of applications desktop color systems have arrived.

Although laser printing has taken over the monochrome desktop printing market, color laser printing remains a very expensive proposition. Instead, four other printing technologies now serve the color

market, with system prices ranging from \$350 to \$14,000. If desktop color printers were cars, the color dot-matrix would be a Yugo; the color ink jet, a Chevrolet; the thermal-wax printer, a Cadillac; and the sublimation-dye printer, a Bentley. They all move you down the same highway, but some get you there in greater style.

**FAST TURNAROUND AND CHEAP.** The applications for which color printing can play a role range from the simple addition of color text headings and color bar graphs to the near-photographic rendering of advertising layouts with startlingly vivid images.

Desktop color printing can replace the expensive and time-consuming process of obtaining color "proofs" and "comps" from photo processing studios — a necessary step on the road to big-time color printing.

Perhaps more important, desktop color printing can produce limited-run, quick-turnaround copies of presentations for in-house corporate use. Instead of sending off to Genigraphics for color slides, for example, directly printing onto transparencies can produce a colorful presentation in minutes, for a fraction of the cost. Add to this that color scanning and other methods of input have recently slipped into the under \$1,000 region, and the options for bringing color output to corporate users expand tremendously.

**THE SHORTEST ROUTE.** Color dot matrix printing is clearly the easiest — and cheapest — way to buy into color printing. Printers such as the Citizen GSX-140/145 are fundamentally monochrome printers, but with a four-color ribbon, a mechanical ribbon lifter, and interface software.

"In many cases, we are seeing people buy the printer as a monochrome printer for \$300 or so for their company, and then actually pay the extra \$70 or so themselves to turn it into a color printer," said David Ball, group product manager for Citizen America. "Many of these are young managers on the rise, who want their reports to stand out just a little from the others."

In these cases, the primary use of the color capability of the dot-matrix printer is for spot colors, for the purpose of setting off text, or creating bar charts, according to Ball. "Corel is now recommending that people use the color dot-matrix printers for color proofing because it costs one-tenth the price of the thermal wax printers," he said. Many applications include a driver to deliver color on the PC to dot-matrix printers.

See Printers, Page 60

## Putting Images on Paper: How Different Color Print Technologies Work

**COLOR DOT MATRIX:** Color dot-matrix printers essentially work just like their monochrome siblings. Twenty-four electrically driven hammers in the print head strike the ribbon, transferring ink from the ribbon onto the paper. A ribbon-positioning mechanism raises the ribbon so that the appropriate color band is struck. Before the paper is advanced, the print head makes four passes over a line, depositing ink from four successive color bands.

The print head mechanisms are generally capable of achieving 360-dpi positioning, but the standard driver for color dot-matrix printers (Epson's LQ2550) will only drive the heads at 180-by-180-dpi resolutions.

**COLOR INK JET:** This technology is also similar to its monochrome counterpart. Instead of hammers and an inked ribbon, jets of quick-drying ink are deposited directly onto the paper like a spray painter. With color ink jet, four sets of ink-jet nozzles are timed so that the successive color is deposited after the previous color ink has dried on the paper.

Unlike the yellow-red-blue-black ribbon used in dot-matrix printers, the color ink jets use the color printing process colors, yellow, magenta, cyan, and black.

The resolution currently available on color ink-jet printers is 180 by 180 dpi. None of the ink-jet printer vendors is ready to announce next year's products

yet, but all of them expect the industry to produce color ink-jet printers of 300-by-300-dpi resolution or better, priced at about \$200 more than the current comparable models. This will be a great breakthrough for color desktop publishing, because it will combine the quality of the thermal-wax printers with the \$1,200 to \$2,500 price tag.

**THERMAL WAX:** Is it ink or is it wax? Actually, it's ink that acts like wax. Four successive page-size sheets of ink—yellow, magenta, cyan, and black—are used for every page that is printed. For example, when a sheet of cyan is rolled in front of the page to be printed, a thermal head passes across the page, heating the points of the gel that are to be transferred to the page. The dried ink-wax is capable of carrying very vivid colors.

These drops of ink-wax are opaque, with each color covering the colors underneath. Because of this, the drops are deposited at "angles," so that the colors underneath can show through those on top.

Thermal-wax printing is done using only specially coated paper. This summer, however, DOS expert Tektronix to introduce a thermal-wax printer that uses plain paper.

**SUBLIMATION DYE:** The thermal mechanism and ink rolls of sublimation-dye printers look very much like those of thermal-wax printers, but the physical process is different and so is the paper.

The technology is called sublimation dye because the thermal head actually turns the ink gel into a gas. The longer the thermal head heats a color dot, the more color saturation that dot receives. The Mitsubishi S340 printer, for example, has 256, or 8 bits, of different temperatures that it can deliver to a color dot. With 8 bits of color for each primary gel, the printer can deliver up to 16 million different colors.

The Mitsubishi dye-sublimation printer uses no dithering at all. The reason is that the dye sublimation process already allows for up to 256 different levels of color saturation on each dot. Although the dot sizes stay the same, the amount of time that the thermal head spends transferring ink to the dot determines the color saturation of the dot, according to Cal Mura, product manager for Mitsubishi's dye-sublimation product line.

The result is that, while the thermal-wax printers go to an effective 50 dpi through the process of dithering, the dye-sublimation printers stay at 150 dpi, earning the appellation "near photographic." An upcoming 300-dpi dye-sublimation printer from Mitsubishi may take the extra step to purely "photographic."

The receiving paper is chemically coated in layers, much like photographic color print paper. The ink gas released from the gel penetrates and chemically reacts with only the color layer for which it is intended. The result: something that looks very much like photography.

Why go through all this trouble? Because the sublimation-dye method, unlike the ink-jet and thermal-wax technologies, can vary the saturation of the color dots, thus producing far more color possibilities within the same dot resolution.

## The Four Types of Color Printers: How Do They Compare?



Dot Matrix  
Citizen GSX-140/145.



Ink Jet  
Hewlett-Packard Paintwriter XL.



Thermal Wax  
QMS Colorscript 100 Model 110.



Dye Sublimation  
Mitsubishi S340.

### The Economics of Desktop Color Printers



These comparative illustrations include one representative from each of the four color printer categories—dot matrix, ink jet, thermal wax, and sublimation dye transfer—each printing the same color image file.

Included were the Citizen GSX-145 dot-matrix printer, the Hewlett-Packard Paintwriter XL ink jet, the QMS Colorscript 100 model 110 thermal wax printer, and the Mitsubishi 340 sublimation-dye printer. (In the case of thermal-wax printers, we looked at both the Tektronix Phaser II PX and the QMS Colorscript 100, in order to examine the difference that PostScript cloning made. QMS claims that it licenses Adobe PostScript directly, whereas Tektronix uses a clone of PostScript. However, Tektronix uses a technique called adaptive dithering, which it claims gives a slightly improved image over the PostScript method of dithering. In our tests, we found the differences in printed image were small.)

Other representatives of each class may have been equally good choices. These printers were selected for their capability to represent their specific class of printers. These printers can range in price from \$350 to \$14,000.

To differentiate the capabilities of these printers, we selected a flesh-tone image because it is one of the more demanding color printing applications. We printed images in both the Macintosh and PC environment, using CorelDraw for Windows to print the PC ver-

sions and Aldus PageMaker and Adobe PhotoShop on the Mac. (Movements of files from Mac to PC and back were handled by exchanging an MS-DOS-formatted 1.44-megabyte diskette between the two systems, using the Data Viz MacLink Plus/PC translators, Version 5.0, which contains a DOS Mounter that allows the DOS diskette to show up on a Mac desktop.)

The sample files used here were 2 inches by 3 inches. Without any other printing on the page, each sample took between 3 and 4 minutes to print.

As the comparison graphics show, the color ink-jet printers can produce an acceptable flesh-tone image. The printer driver supplied with the system offers different dithering patterns, including pattern, scatter, and cluster. For the size and resolution of the image we were reproducing, the cluster method gave the best results, and it was used in the figure.

We also used a variety of software to adjust the image for optimal printing. (See accompanying story, Page 60.)

Of the four printers tested, only the Citizen printer made considerable noise. Although its noise level was less than most dot-matrix printers, it was still loud compared to the other types of printers. All of the other printing technologies are quiet enough not to wake your neighbor in the next cubicle. We did not make enough copies of images to see any serious color pollution of the Citizen color ribbon, or of the images printed, as Citizen warned may occur.

Dimensions: 7.5 x 9.75 x .25"

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Speed: 20 wpm

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but 2 really hard covers

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The ready-to-go Tandon NB/386sx boasts the 20 MHz Intel® 80386SX processor, the highest level of power you can get in a battery-powered notebook today. But that's just for starters. You also get a 40MB IDE hard drive and a 3.5" internal floppy drive, 2 MBs of memory expandable to a whopping 16MBs, and three hours of battery life. Not bad for a 6.5 lb. machine small enough to fit on this page.

The NB/386sx is extremely versatile, too. It has one parallel port and two serial ports. So you can plug into a large combination of devices like a printer, mouse, graphic tablet, or modem. At the office, you can connect up to an external monitor and keyboard, or even communicate with your

company's larger computers.

And while the Tandon notebook may be extremely small, its extra large 9 inch, non-glare VGA display makes even the most complex graphics easy to read. The paper-white screen, specially designed to reduce eye strain, provides a sharp, bright image using triple super twist LCD technology.

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So if you're interested in a great little portable computer with desktop performance, call us today about the new Tandon NB/386sx or the Tandon NB/386sx, Model 60 with a 60MB hard drive, for only \$3,995.

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when you compare Notebook features you  
get for the dollars spent.”**

*Byte, March 1991*

	Tandon NB 386sx/20	Compaq LTE 386/20	T.I. Travelmate 3000
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## FROM THE EDITOR

# Users Win Separating Data From Programs

Recently, we've seen a flood of new Windows development tools, ranging from improvements to Asymetrix's ToolBook to Borland's ObjectVision to Microsoft's Visual Basic.

These products are important for a variety of reasons. Most of them automate many of the Windows-specific commands, making it easier for both corporate and commercial developers to create Windows programs. They bring more options to the Windows environment, again broadening the choices and thus the number of programming participants. And by making programming easier, they make it possible for people with various degrees of programming experience to create their own applications. Someone with little or no experience could create an application in a program such as ObjectVision or ToolBook; and someone with a relatively small amount of experience in Basic can create a nice-looking Windows application in Visual Basic; and someone with just a reasonable knowledge of Pascal could really take advantage of Turbo Pascal for Windows.

One of the most interesting, and least noticed, trends accompanying all of this activity is that the programs and their development environments are now becoming more separate from the data and the data format.

You can see this in Borland's plans for its Windows development tools. The company plans to offer Windows versions of

ObjectVision, Turbo Pascal for Windows, Turbo xBase (a dBase compiler), and Paradox — each of which will be capable of directly working with data in local Paradox, DBF, or spreadsheet formats, or via a network to Btrieve or various OS/2 databases.

Similarly, when Microsoft announced Visual Basic, a variety of third-party vendors announced Dynamic Link Libraries and other tools that let Basic programs access data in all sorts of different formats.

Why is this important? Because so many people already have data in existing applications, in a very specific format, and they've often felt locked into the application that created that data. In most cases, the data was far more valuable than the application. Now, by letting a variety of programming environments access this data, it makes it much easier for people to develop new applications that are still compatible with the data that already exists. In the long run, this should mean that different people can use different ways of querying or analyzing the same data, including the potential for using more applications customized for their individual needs.

There are still a number of issues — notably security and reliability — that need to be resolved before customers switch to such systems. Borland and Microsoft are sure to be challenged by other companies, but they have taken a big step in the right direction.

— Michael J. Miller

## TO THE EDITOR

### Apple Bashing in InfoWorld

Do you think you could have fit one more negative story about System 7 in your May 13 issue? I'm not quite sure you made your bias clear enough. Let's start off with reports from the DOS side and not the Mac. Of course the DOS community is going to dispute the value of System 7.

Why not mention how networkable Publish and Subscribe will create a new era of workgroup computing? Or how Balloon help makes the Mac even easier to use? Or how built-in networking will let everyone trade, share, and edit files on other worker's machines without relying on a networking MIS guru?

I look forward to reading about these things in your magazine as "revolutions" and "the greatest thing since sliced bread" when they are incorporated in Windows 4.0 years from now.

Louis Rodriguez  
Newport Beach, CA

I am writing to express my displeasure regarding the thinly veiled Apple-bashing present in your May 13 issue.

All four of the articles regarding the release of Apple's long-awaited System 7.0 were negatively slanted. The headlines tell the story: "Apple Rolls Out Overdue System 7.0," "DOS Community Disputes Value of Apple System 7.0" (so

what?), "Wary Users Take A Long Look at System 7.0."

While other publications devoted articles to the new features in the operating system, InfoWorld confirmed its Mac-bashing reputation. In contrast, PC Week devoted a special section to the introduction, and presented fair, in-depth articles concerning the impact of the release on the installed base of Macintosh users.

You chose to fan the fires of user anxiety with disinformation and slanted reporting. These articles served no one. They only blench the reputation of your otherwise fine paper.

I used to dismiss as thin-skinned the complaints of Mac and Amiga users about the presumed bias of InfoWorld's reporting, but no longer.

Dave Walker  
Detroit

### One 486 Chip Is Enough

This is just a short note to voice my displeasure with Intel over its plan to sell a 486SX chip.

Either let it be the true 486 with cache, floating decimal, and a math coprocessor, or let it be nothing.

I wish that people would stand up and say no to Intel about what it is doing. Am I the only one who feels this way?

Joe Sprinkle  
Detroit

### Can You Say Unix?

Am I missing something?

In the May 13 issue, on Page 48, Rachel Parker said in her "State of the Industry" column on OS/2, "After all, customers are still eager for multitasking, true network support, greater system security, and flexibility at the same time."

On Page 114 Ruthann Quindlen said in "Q&A": "There is no doubt that the market clearly needs a 32-bit operating system."

I was under the impression that we already had such a system. Unix is a 32-bit system that has all the features Parker wants, including networking based on widely accepted and standard protocols rather than the proprietary mess that prevails on PCs.

Unix has more applications than OS/2, has GUIs as good or better than Presentation Manager, and is not tied to one chip maker's architecture.

Ted Nolan  
Fort Bragg, Indiana

Please write to Letters, InfoWorld, 1060 Marsh Road, Menlo Park, CA 94025; (MCI Mail: 259-4127; Compuserve: 73267.1537). Letters can also be faxed to (415) 328-1049. Include your name, address, and daytime telephone number. Letters selected for publication will be edited for length and clarity.

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## Ami Pro for Windows




**FUTURE TENSE** ■ BY PAUL SAFFO

# AT&T, NCR Chase Computer, Communication Revolution

Anticipating a revolution is like chasing a cyclone — the inevitable always arrives in maddeningly unpredictable ways. Just ask AT&T, whose recent acquisition of NCR is the latest episode in a decades-long quest to

capitalize on the long-predicted collision of the computing and communications industries.

Just under a decade ago, on January 8, 1982, Federal Judge Harold Greene issued the Modified Final Judgment, an antitrust decision granting AT&T permission to enter the computer business in

exchange for the divestiture of the Bell Operating Companies. The decision came not a moment too soon for AT&T; academics and executives alike agreed that computers and communications systems would soon be indistinguishable. NEC's president Koji Kobayashi coined the term "C & C" — computers and

communications — for this inevitable merger, while Harvard professor Tony Oettinger more bluntly observed that "the microprocessor was the solvent leaching the glue from the telecommunications industry." A super industry was being born, and AT&T was convinced that it had to bridge both worlds in order to survive.

IBM shared this vision and desperately wanted in to the communications business, but a long-standing antitrust suit that threatened to break up the company forced it to put its plans on hold. It was no coincidence that this suit was dropped the same day the Modified Final Judgment was handed down. Both AT&T and IBM wasted no time turning their visions into business reality. AT&T promptly invested in computer maker Olivetti, and IBM bought into Rolm Corp., an up-and-coming Silicon Valley PBX manufacturer.

Both deals were based on the same assumption: The collision of computing and communications would be felt first at the desktop, and each company held the missing piece that the giants needed to prevail in the coming C & C super industry. Spooked by the IBM PC's success, AT&T began selling personal computers manufactured by Olivetti, hoping they would become a beachhead for the AT&T network. And IBM concluded that PBXes — office phone switches — would form the "office of the future's" communications heart. Its computers would talk to each other over office phone lines that Rolm's PBXes would wrest from the phone companies' control. AT&T and IBM might just as well have been chasing funnel clouds, for reality fell well of their visionary targets. The AT&T PC was a marketplace dud, and IBM watched helplessly as PBXes became low-cost commodities never connected to PCs. AT&T did not shake itself loose of Olivetti until 1989, the same year that IBM managed to sell a now-anemic Rolm at a loss to the German telecommunications company, Siemens.

Now AT&T is trying again, certain that NCR offers a passport to higher ground. NCR is only the fifth largest computer maker in the United States, but it has a solid Unix workstation business, and it leads in the manufacture of automated teller machines and retail point-of-sale terminals. AT&T has concluded that the C & C revolution will strike first in transaction processing, and adding NCR's capabilities to its network skills will give AT&T a global edge.

IBM is certain to re-enter the C & C fray, also betting on a transaction processing future by partnering with a major telecommunications player, such as Japan's NTT or Great Britain's British Telecom. At the moment AT&T appears to hold the edge, but the coming collision remains as vague and uncertain as ever. Transaction processing could be the leading edge of a C & C future of Jetson-like teleshopping and talking machines, or it could be another desktop nonevent. A new super industry is slowly appearing on the horizon, but its eventual shape is certain to surprise us all.

Paul Saffo is a Research Fellow at Institute For The Future, in Menlo Park, California.

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# PRODUCT COMPARISON



## 33-MHz 386: Round 2

*InfoWorld evaluates nine PCs based on Intel's most powerful 80386 chip.*

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**P**ersonal computers based on Intel Corp.'s 33-MHz 80386 chip are suitable for a wide range of applications. From stand-alone systems to powerful file servers, computers based on this chip provide a lot of price/performance value. Intel's recent release of the 20-MHz 486SX will, most likely, drive down the price of 386s, making these systems even more attractive.

In this product comparison, *InfoWorld* evaluates seven full-size desktop PCs and two tower models. They are the Acer 1100/33, CompuAdd 333, Everex Step 386/33, Gateway 2000 386/33C, Leading Edge D3/33, Mitac MPC 4000G, Northgate Elegance 386/33, Tandon 386/33, and Zeos 386-33.

In a previous comparison (December 17, 1990, Page 59) we evaluated 33-MHz 386-based PCs from Advanced Logic Research Inc., Arche Technologies Inc., AST Research Inc., AT&T, Compaq Computer Corp., Dell Computer Corp., NEC Technologies Inc., and PC Craft Inc.

**TRENDS.** All of the machines in this comparison have Industry Standard Architecture (ISA) buses. This suggests that Extended Industry Standard Architecture (EISA) has not made much headway as a replacement for ISA.

RAM caching and IDE hard disk controllers have, however, become prominent features. All nine systems had high-speed

static RAM cache, ranging from 32K to 256K. Nearly all of the units we evaluated included IDE hard disks and controllers for our workstation configuration. In our previous comparison, the only 33-MHz 386 with an IDE drive was Dell's.

The list prices of these systems fall within a relatively narrow range — roughly \$3,000 to \$5,500. Based on a representative 25 percent discount for units sold through dealers (as opposed to mail-order, where the list price is typically the "real" price), the actual price range is even narrower — \$3,000 to just over \$4,100.

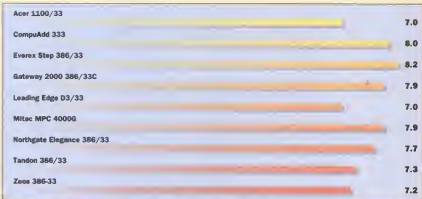
### What We Found

**CPU-intensive:** CPU speed did not vary significantly among the PCs in this comparison. There was only an 11 percent difference between the fastest unit (Everex) and the slowest (Acer). With one exception, there was a direct correlation between the size of a system's cache RAM and its speed.

The Everex had the largest cache (256K) and also the best speed. The second fastest system — Mitac — also contained the second largest cache (128K). The slowest PC — Acer — had a 32K RAM cache — the smallest of the group. Except for Zeos, the balance of the systems had 64K caches and turned in typical CPU speed scores. Zeos was shipped with 128K of cache, but

See What We Found, Page 76

### THE SCORES



### EXECUTIVE SUMMARY

**T**here was not a great deal of diversity among this group of 33-MHz 386s. All are ISA-based systems and all but two have full-size AT-style cases. The exceptions were tower designs. Overall, these units offer fine speed, solid construction, expandability, and competitive pricing.

The top-scoring PC in this comparison is the Everex Step 386/33. This desktop unit combines impressive performance with a clean design and moderate price. It received excellent or very good scores in every category except file server throughput (for which it received a good score). The Step had the fastest CPU and multitasking throughput, and the third fastest disk speed of the group. Its front panel has a unique sliding panel to protect the unit's speed, reset, and speaker switches. The Step is sold through dealer channels.

The CompuAdd 333 had the fastest disk speed, but it was also the only unit shipped with a high-performance ESDI hard disk and caching controller for our workstation configuration. This system has the third fastest CPU throughput, fine documentation and technical support, is sold through direct sales, and has a moderate price. The CompuAdd's overall design was hindered by an exposed reset switch and no security features.

The Gateway 2000 386/33C and American Mitac's Mitac NPC 4000G tied for third place. The Mitac had the lowest price and the top support policies of systems sold through dealer channels. It has the second fastest CPU throughput, but the second slowest disk throughput. This was the only system in the comparison with a minitower case.

Gateway had fine CPU speed and the second fastest disk-intensive throughput. This system is

sold through direct sales, had top-notch technical support, and had the lowest price in this comparison. Its final score, however, suffered somewhat from design problems on the motherboard.

Northgate's Elegance 386/33 is a typical desktop system sold through direct sales. It exhibited above-average CPU, multitasking, and file server speed, but below-average disk speed. The Elegance 386/33 also has extensive documentation, top-notch support policies, and a moderate price.

The Tandon 386/33 has above-average performance, with the second fastest file server throughput. Although Tandon has top-notch technical support policies, our calls to its support lines were not as informative as we would have expected. The Tandon's price is competitive with other systems sold through direct sales.

The only full-size tower system in this comparison is the Zeos 386-33. It has below-average overall performance, with the slowest disk-intensive and file server speeds of the group. Otherwise, the Zeos is solidly constructed, has top-notch expandability, and, for a tower unit, is competitively priced for systems sold through direct sales.

The Acer 1100/33 and Leading Edge D3/33 have below-average speed for this group. The Acer had the slowest CPU speed and the second slowest multitasking and file server speeds. Leading Edge turned in average disk and file server speed, but it had the second slowest CPU throughput and the slowest multitasking speed. At over \$5,400 for our workstation configuration, Acer has the highest list price in this comparison. Leading Edge, on the other hand, has the second-lowest price of systems sold through dealer channels.

**In-Depth Comparison** 72

**How We Test** 76

**Disk Caching Analysis** 84

## REPORT CARD

## 33-MHz 386 Computers - Round 2



	InfoWorld weighting	Your weighting	Acer 1100/33	CompuAdd 333	Everex Step 386/33
<b>List Price:</b>			<b>\$5,489</b> for workstation configuration; \$6,839 for file server configuration; sold through dealer channels.	<b>\$4,193</b> for workstation configuration; \$5,877 for file server configuration; sold through direct sales.	<b>\$4,997</b> for workstation configuration; \$6,395 for file server configuration; sold through dealer channels.
<b>Performance</b>					
Speed — CPU-intensive	(100)	( )	Slowest in class; 11 percent slower than Everex; 32K RAM cache. <b>Good</b>	Third fastest in group; 3 percent slower than Everex; 64K RAM cache. <b>Excellent</b>	Fastest in group; 256K RAM cache. <b>Excellent</b>
Speed — Disk-intensive	(75)	( )	Twenty-nine percent slower than CompuAdd; 200-megabyte IDE hard disk. <b>Good</b>	Fastest in group; 150-megabyte ESDI hard disk. <b>Excellent</b>	Third fastest; 18 percent slower than CompuAdd; 200-megabyte IDE hard disk. <b>Very Good</b>
Speed — Multitasking	(75)	( )	Fifteen percent slower than Everex. <b>Very Good</b>	Second fastest; 7 percent slower than Everex. <b>Very Good</b>	Fastest in group. <b>Excellent</b>
Speed — File server	(100)	( )	Second slowest; 19 percent slower than CompuAdd. <b>Good</b>	Fastest in group. <b>Very Good</b>	Fifteen percent slower than CompuAdd. <b>Good</b>
<b>Compatibility</b>	(175)	( )	No hardware or software compatibility problems; alternate CPU speed. <b>Excellent</b>	No hardware or software compatibility problems; two alternate CPU speeds. <b>Excellent</b>	No hardware or software compatibility problems; alternate CPU speed. <b>Excellent</b>
<b>Expandability</b>	(75)	( )	Three drive bays and five slots open after configuration; supports 24 megabytes of 32-bit RAM. <b>Good</b>	Three drive bays and five slots open after configuration; supports 16 megabytes of 32-bit RAM. <b>Good</b>	Three drive bays and six slots open after configuration; supports 64 megabytes of 32-bit RAM. <b>Very Good</b>
<b>Documentation</b>	(50)	( )	Manuals well organized; relatively comprehensive; weak troubleshooting section. <b>Good</b>	Comprehensive documentation; fine troubleshooting section. <b>Very Good</b>	Well written; easy to read; complete troubleshooting guide; helpful diagrams. <b>Very Good</b>
<b>Setup</b>	(75)	( )	Easy access to SIMM sockets, coprocessor socket; ROM-based setup; few jumpers and DIP switches. <b>Good</b>	Easy access to SIMM, coprocessor sockets; ROM-based setup; must switch when installing coprocessor. <b>Good</b>	Easy access to SIMM and coprocessor sockets; ROM-based configuration. <b>Very Good</b>
<b>System design</b>	(50)	( )	Full-size desktop case; front-panel power switch, reset button; no case lock; a few patch wires on motherboard. <b>Good</b>	Full-size desktop case; exposed, front-mounted reset switch; no security features; clean motherboard. <b>Satisfactory</b>	Full-size desktop case; sliding door covers speed, reset, and speaker switches; patch-free motherboard. <b>Very Good</b>
<b>Support policies</b>	(50)	( )	Two-year warranty; toll-free support lines; extended hours; BBS. <b>Very Good</b>	Thirty-day money-back guarantee; one-year free on-site service; toll-free support lines; BBS. <b>Excellent</b>	One-year free on-site service; extended hours; BBS support. <b>Very Good</b>
<b>Technical support</b>	(75)	( )	Score based on reader survey. <b>Good</b>	Score based on reader survey. <b>Very Good</b>	Score based on reader survey. <b>Very Good</b>
<b>Value</b>	(100)	( )	Bundled with DOS 3.3, Windows 3.0, Microsoft Mouse; lowest price of units sold through dealer channels; typical overall performance. <b>Good</b>	Bundled with DOS 4.01, Windows 3.0, and CompuAdd mouse; top disk and file server performance; most expensive unit sold through direct sales. <b>Good</b>	Bundled with DOS 4.01, Windows 3.0, Logitech mouse; top-notch overall performance. <b>Very Good</b>
<b>Final score</b>			<b>7.0</b>	<b>8.0</b>	<b>8.2</b>
<b>Your weighted score</b>					

## GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

**Excellent** = 1.0 — Outstanding in all areas.

**Very Good** = 0.75 — Meets all essential criteria and offers significant advantages.

**Good** = 0.625 — Meets essential criteria and includes some special features.

**Satisfactory** = 0.5 — Meets essential criteria.

**Poor** = 0.25 — Falls short in essential areas.

**Unacceptable** or **N/A** = 0.0 — Fails to meet minimum standards or lacks this feature.

See Page 76 for continuation of Guide to Report Card Scores and information on the Buyers Assurance Seal.



**Company:** Acer America Corp., 401 Charcot Ave., San Jose, CA 95131; (408) 922-0333.

**Test Configuration:** Workstation: Enhanced keyboard; ATI 16-bit VGA board; 200-megabyte Maxtor hard disk with IDE; 5¼-inch floppy drive; 4 megabytes of 80-nanosecond RAM; 32K of 20-nanosecond RAM cache.

**File server:** 330-megabyte Seagate hard disk with Adaptec SCSI controller; 8 megabytes of RAM.



**Company:** CompuAdd Corp., 12303 Technology Blvd., Austin, TX 78727; (800) 627-1967.

**Test Configuration:** Workstation: Enhanced keyboard; CompuAdd Hi-Res VGA Controller board with 1 megabyte of RAM; 150-megabyte Seagate hard disk with ESDI 1:1 controller; 5¼-inch floppy drive; 4 megabytes of 80-nanosecond RAM; 64K of 15-nanosecond RAM cache.

**File server:** 630-megabyte Maxtor hard disk; 8 megabytes of RAM.



**Company:** Everex Systems Inc., 48431 Millmont Drive, Fremont, CA 94538; (415) 498-1111, (800) 821-0806.

**Test Configuration:** Workstation: Enhanced keyboard; Everex Viewpoint VRAM 16-bit VGA board with 512K of RAM; 200-megabyte IDE Maxtor hard disk; 5¼-inch floppy drive; 4 megabytes of 80-nanosecond RAM; 256K of 25-nanosecond RAM cache.

**File server:** 338-megabyte Maxtor hard disk with ESDI Ultrastor controller (1 megabyte of RAM on controller); 8 megabytes of RAM.

**Gateway 2000  
386/33C**


**\$2,995** for workstation configuration;  
**\$3,770** for file server configuration; sold  
through direct sales.

Five percent slower than Everex; 64K  
RAM cache. **Very Good**

Second fastest; 7 percent slower than  
CompuAdd; 200-megabyte IDE hard  
disk. **Very Good**

Third fastest; 9 percent slower than  
Everex. **Very Good**

Third fastest; 3 percent slower than  
CompuAdd. **Very Good**

No hardware or software compatibility  
problems; two alternate CPU speeds.  
**Excellent**

Three drive bays and six slots open after  
configuration; supports 16 mega-  
bytes of 32-bit RAM. **Good**

Documentation contains essential fea-  
tures; adequate troubleshooting sec-  
tion; useful diagrams. **Good**

Coprocessor socket located under drive  
bay; some jumpers difficult to reach;  
ROM-based setup. **Satisfactory**

Full-size desktop case; front-panel  
speed and reset switches; patch-free  
motherboard. **Very Good**

Free lifetime labor; 30-day money-back  
guarantee; one-year free on-site ser-  
vice; BBS. **Excellent**

Score based on reader survey. **Excellent**

Bundled with DOS 3.3 or 4.01, Win-  
dows 3.0, and Microsoft Mouse; fine  
performance; least expensive unit in  
this comparison. **Very Good**

**7.9**


**Company:** Gateway 2000 Inc., 610  
Gateway Drive, North Sioux City, SD  
57049; (605) 232-2000, (800) 523-  
2000.

**Test Configuration:** Workstation: En-  
hanced keyboard; Diamond SpeedStar  
16-bit VGA adapter with 1 megabyte of  
RAM; 200-megabyte Western Digital  
hard disk with IDE controller; 5¼-inch  
and 3½-inch floppy drives; 4 mega-  
bytes of 80-nanosecond RAM; 64K of  
25-nanosecond RAM cache.

**File server:** 320-megabyte Seagate  
ESDI hard disk, 8 megabytes of RAM.

**Leading Edge D3/33**

**\$3,198** for workstation configuration;  
**\$4,096** for file server configuration; sold  
through dealer channels.

Second slowest; 9 percent slower than  
Everex; 64K RAM cache. **Good**

Twenty-six percent slower than  
CompuAdd; 100-megabyte IDE hard  
disk. **Good**

Slowest in group; 19 percent slower  
than Everex. **Good**

Eight percent slower than CompuAdd.  
**Very Good**

No hardware or software compatibility  
problems; alternate CPU speed.  
**Excellent**

Three drive bays and seven slots open  
after configuration; supports 16 mega-  
bytes of 32-bit RAM. **Good**

Documentation well organized, compre-  
hensive; fine troubleshooting section.  
**Very Good**

Adequate access to SIMM sockets;  
ROM-based setup; numerous jumpers.  
**Satisfactory**

Full-size desktop case; front-panel  
power switch, reset button; patches on  
motherboard. **Good**

Choice of 20-month carry-in warranty or  
six months of on-site service; extended  
hours; BBS. **Good**

Score based on reader survey. **Satisfactory**

Average overall performance; bargain  
price — lowest among dealer channel  
units; typical 33-MHz 386 system.  
**Very Good**

**7.0**


**Company:** Leading Edge Products Inc.,  
117 Flanders Road, Westborough, MA  
01581; (508) 836-4800, (800) 874-  
3340.

**Test Configuration:** Workstation: En-  
hanced keyboard; ATI 16-bit VGA board;  
100-megabyte Quantum IDE hard disk;  
5¼-inch floppy drive; 4 megabytes of  
80-nanosecond RAM; 64K of 25-nano-  
second RAM cache.

**File server:** 200-megabyte Conner  
IDE hard disk; 8 megabytes of RAM.

**Mitac MPC 4000G**

**\$4,225** for workstation configuration;  
**\$6,140** for file server configuration; sold  
through dealer channels.

Second fastest; 2 percent slower than  
Everex; 128K RAM cache. **Excellent**

Second slowest; 31 percent slower  
than CompuAdd; 100-megabyte IDE  
hard disk. **Good**

Fifteen percent slower than Everex.  
**Very Good**

Tied with Acer; 19 percent slower than  
CompuAdd. **Good**

No hardware or software compatibility  
problems; alternate CPU speed.  
**Excellent**

Four drive bays and six slots open after  
configuration; supports 24 megabytes  
of 32-bit RAM. **Very Good**

Manuals well organized, comprehensive;  
impressive troubleshooting section.  
**Very Good**

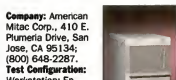
Easy access to coprocessor socket,  
drive bays; ROM-based setup. **Good**

Mini-tower case; front-panel power  
switch; case lock; password protection;  
a few patches on motherboard. **Good**

One-year free on-site service; 30-day  
money-back guarantee; toll-free support  
lines; extended hours; BBS. **Excellent**

Score based on our calls. **Very Good**

Bundled with DOS 4.01, nicely de-  
signed mini-tower case; fine CPU per-  
formance, but below-average disk speed;  
competitive price. **Very Good**

**7.9**


**Company:** American  
Mitac Corp., 410 E.  
Plumeria Drive, San  
Jose, CA 95134;  
(800) 648-2287.

**Test Configuration:** Workstation: En-  
hanced keyboard;  
Western Digital 16-  
bit VGA adapter;  
100-megabyte  
Conner hard disk  
with built-in IDE con-  
troller; 3½-inch floppy  
drives; 4 megabytes of 80-  
nanosecond RAM; 128K of 25-  
nanosecond RAM cache.

**File server:** 330-megabyte Seagate  
hard disk with Adaptec SCSI controller;  
8 megabytes of RAM.

**Northgate Elegance  
386/33**


**\$3,669** for workstation configuration;  
**\$5,208** for file server configuration; sold  
through direct sales.

Four percent slower than Everex; 64K  
of RAM cache. **Very Good**

Twenty-seven percent slower than  
CompuAdd; 100-megabyte IDE hard  
disk. **Good**

Nine percent slower than Everex.  
**Very Good**

Six percent slower than CompuAdd.  
**Very Good**

No hardware or software compatibility  
problems; alternate CPU speed.  
**Excellent**

Three drive bays and five slots open after  
configuration; supports 16 mega-  
bytes of 32-bit RAM. **Good**

Documentation comprises several small  
manuals; comprehensive; includes  
quick-reference card. **Very Good**

Easy access to SIMM sockets; ROM-  
based diagnostics; adequate access to  
jumpers and DIP switches. **Good**

Full-size desktop case; front-panel  
mounted reset switch somewhat ex-  
posed; clean motherboard. **Good**

Thirty-day money-back guarantee; one-  
year free on-site service; toll-free sup-  
port lines; BBS. **Excellent**

Score based on reader survey. **Very Good**

Systems sold with 4 or more mega-  
bytes of RAM bundled with DOS 4.01,  
Windows 3.0, Microsoft Mouse; fine  
overall performance. **Very Good**

**7.7**


**Company:** Northgate Computer Systems  
Inc., P.O. Box 59080, Minneapolis, MN  
55459-0080; (800) 548-1993.

**Test Configuration:** Workstation: North-  
gate OmniKey II enhanced keyboard;  
Orchid ProDesigner II VGA adapter with  
1 megabyte of RAM; 100-megabyte  
Toshiba hard disk with IDE controller;  
5¼- and 3½-inch floppy drives; 4 mega-  
bytes of 80-nanosecond RAM; 64K of  
20-nanosecond RAM cache.

**File server:** 300-megabyte Micro-  
polis hard disk with Adaptec SCSI con-  
troller; 8 megabytes of RAM.



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## REPORT CARD

## 33-MHz 386 Computers

	InfoWorld weighting	Your weighting	Tandon 386/33	Zeos 386-33
<b>List Price:</b>			<b>\$3,727</b> for workstation configuration; <b>\$5,147</b> for file server configuration (prices include color monitor).	<b>\$3,545</b> for workstation configuration; <b>\$5,185</b> for file server configuration (prices include color VGA monitor).
<b>Performance</b>				
Speed — CPU-intensive	(100)	( )	Four percent slower than Everex; 64K of RAM cache. <b>Very Good</b>	Eight percent slower than Everex; 128K of RAM cache. <b>Very Good</b>
Speed — Disk-intensive	(75)	( )	Twenty-one percent slower than Compu- Add; 110-megabyte IDE hard disk. <b>Very Good</b>	Slowest in group; 43 percent slower than CompuAdd; 130-megabyte IDE hard disk. <b>Satisfactory</b>
Speed — Multitasking	(75)	( )	Nine percent slower than Everex. <b>Very Good</b>	Ten percent slower than Everex. <b>Very Good</b>
Speed — File server	(100)	( )	Second fastest; 2 percent slower than CompuAdd. <b>Very Good</b>	Slowest in group; 22 percent slower than CompuAdd. <b>Good</b>
<b>Compatibility</b>	(175)	( )	No hardware or software compatibility problems; alternate CPU speed. <b>Excellent</b>	No hardware or software compatibility problems; alternate CPU speed. <b>Excellent</b>
<b>Expandability</b>	(75)	( )	Three drive bays and five slots open after configuration; supports 16 megabytes of 32-bit RAM. <b>Good</b>	Six drive bays and five slots open after configuration; supports 32 megabytes of 32-bit RAM. <b>Very Good</b>
<b>Documentation</b>	(50)	( )	Manuals well organized and comprehensive. <b>Very Good</b>	Manuals well organized and comprehensive; no specifications section. <b>Very Good</b>
<b>Setup</b>	(75)	( )	Coprocessor socket under drive bay; adequate memory socket and configuration switch access. <b>Satisfactory</b>	Easy coprocessor socket access; configuration switches; adequate memory socket access; ROM-based setup. <b>Good</b>
<b>System Design</b>	(50)	( )	Full-size desktop case; front-panel reset switch; power switch on back panel; case clean; motherboard. <b>Good</b>	Full-size tower case; front-panel power switch; reset switch not well protected; no patches on motherboard. <b>Good</b>
<b>Support policies</b>	(50)	( )	Thirty-day money-back guarantee; one- year free on-site service; 24-hour, 365- day-a-year support; BBS. <b>Excellent</b>	Thirty-day money-back guarantee; BBS. <b>Very Good</b>
<b>Technical support</b>	(75)	( )	Score based on our calls. <b>Poor</b>	Score based on our calls. <b>Satisfactory</b>
<b>Value</b>	(100)	( )	Bundled with DOS 3.3 or 4.01, Windows 3.0, and a Microsoft Mouse; fine overall performance; competitive price. <b>Very Good</b>	Bundled with DOS 4.01, Windows 3.0, a Microsoft Mouse; fine CPU speed, but slow disk speed; competitive price. <b>Very Good</b>
<b>Final score</b>			<b>7.3</b>	<b>7.2</b>
<b>Your weighted score</b>				

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

Products receive InfoWorld Buyers Assurance Seals if they meet the following conditions: Software vendors must offer 60-day money-back guarantees on the products, and hardware vendors must offer a one-year repair or replacement warranty. No product is eligible that receives a score lower than satisfactory in any of our Report Card categories. Vendors who qualify have signed contracts with InfoWorld that detail these support policies. InfoWorld awards the Recommended seal to products that, in addition to the above criteria, receive a Report Card score of 8.0 or higher.



**Company:** Tandon Corp., 405 Science Drive, Moorpark, CA 93021; (805) 523-0240, (800) 800-8850.  
**Test Configuration:** Workstation: Enhanced Keyboard; Orchid Prodesigner II VGA adapter with 256K of RAM; Princeton Ultra 14 color monitor; Seagate 110-megabyte IDE hard disk; 54-inch floppy drive; 4 megabytes of 80-nanosecond RAM; 64K of 20-nanosecond cache RAM.

**File server:** 330-megabyte Seagate hard disk with UltraStor ESDI controller (32K cache); 8 megabytes of RAM.

**Company:** Zeos International Ltd., 530 Fifth Ave. NW, St. Paul, MN 55112; (612) 633-4591, (800) 423-5891.

**Test Configuration:** Hardware: Enhanced Keyboard; Diamond SpeedStar VGA adapter with 1 megabyte of RAM; Zeos color VGA monitor; 130-megabyte Seagate IDE hard disk; 54-inch and 3½-inch floppy drives; 4 megabytes of 80-nanosecond RAM; 128K of 25-nanosecond RAM cache.

**File server:** 340-megabyte Seagate hard disk with Adaptec SCSI controller; 8 megabytes of RAM.



## What We Found

Continued From Page 71

it had the third slowest throughput.

The average CPU throughput for this group was slightly faster than for the systems in the December 17, 1990, comparison.

**Disk-intensive:** Hard disk performance varied more than CPU performance with the fastest (CompuAdd) and the slowest (Zeos).

With the exception of CompuAdd, all of the PCs in this comparison had IDE hard disk interfaces for our workstation configuration. Surprisingly, the average speed for this group and similar IDE interfaces was only about 4 percent slower than the average for the systems in the previous comparison (which mostly had SCSI or ESDI controllers).

CompuAdd, which shipped with a 150-megabyte ESDI Seagate drive, was 7 percent faster than the second-place Gateway, with a 200-megabyte IDE Western Digital. The next fastest unit was Everex (18 percent slower than CompuAdd), which shipped with a 200-megabyte Maxtor drive.

Among the rest of the systems, hard drive sizes ranged from 100 to 200 megabytes and there was no direct relationship between drive size and speed.

**Multitasking:** Throughput in this category varied by 19 percent, and the distribution of systems roughly matched CPU speed. The exception was Mitac, which had the second fastest CPU throughput but the third slowest multitasking speed.

**File server:** To some extent, file server throughput followed disk-intensive speed. CompuAdd had the fastest throughput in both categories and Zeos the slowest, 22 percent behind CompuAdd.

There were a few cases where a unit's disk and file server speed did not match. Everex, for example, had the third fastest disk speed but only average file server speed.

Tandon, on the other hand, had better file server speed than disk speed. In fact, it turned in the second fastest file server throughput.

HOW WE TEST

33-MHz 386  
COMPUTERS

This group of 33-MHz 386s was evaluated with the same test suite used for our previous 33-MHz 386 and 486 product comparisons. These tests are designed to evaluate performance and feature differences between popular PC compatibles. The test suites are based on surveys of InfoWorld readers and simulate the tasks users run in real-world environments.

For more details on our test procedures, see "33-MHz 486s Take Their Place" (November 12, 1990, Page 91).

## PERFORMANCE:

**Speed:** To score CPU-intensive, disk-intensive, and multitasking speeds, a system's throughput is measured against others in its class (i.e., systems with similar CPUs). File server throughput is measured against all servers we have

See How We Test, Page 80

## APPLICATIONS TESTS

INFO  
WORLD

## 33-MHz 386 Computers

(test times in hours:minutes:seconds)

## THROUGHPUT TESTS



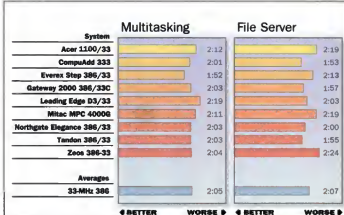
## APPLICATIONS TESTS

INFO  
WORLD

## 33-MHz 386 Computers

(test times in hours:minutes:seconds)

## THROUGHPUT TESTS



## REPORT CARD

33-MHz 386 Computers - Round 1  
(December 17, 1990, Page 59)

	(InfoWorld weighting)	(Your weighting)	ALR Business VEISA 386/33	Arche Pro-File 386-33	AST Premium 386/33TE	AT&T 6386E/ 33 WGS	Compaq Design 386/33L	Dell System 3330	NEC Powermate 386/33E	PC Craft PC 2080/33C
Workstation price*			\$5,789 <sup>1</sup>	\$6,075 <sup>2</sup>	\$9,695 <sup>2</sup>	\$9,995 <sup>1</sup>	\$6,199 <sup>1</sup>	\$3,800	\$6,999 <sup>1</sup>	\$3,450 <sup>4</sup>
File server price			\$7,375	\$6,640	\$9,695	\$11,995	\$9,537	\$6,100	\$7,899	\$4,575
<b>Performance</b>										
Speed — CPU-intensive	(100)	( )	Very Good	Excellent	Good	Very Good	Very Good	Very Good	Satisfactory	Satisfactory
Speed — Disk-intensive	(75)	( )	Very Good	Very Good	Very Good	Good	Good	Very Good	Satisfactory	Good
Speed — Multitasking	(75)	( )	Very Good	Excellent	Satisfactory	Very Good	Very Good	Excellent	Excellent	Good
Speed — File server	(100)	( )	Very Good	Very Good	Very Good	Good	Very Good	Very Good	Satisfactory	Very Good
Software compatibility	(100)	( )	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Hardware compatibility	(75)	( )	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Expandability	(75)	( )	Good	Very Good	Excellent	Excellent	Very Good	Good	Good	Good
<b>Documentation</b>										
Setup	(50)	( )	Good	Satisfactory	Very Good	Very Good	Very Good	Excellent	Very Good	Poor
<b>Serviceability</b>										
System design	(50)	( )	Very Good	Good	Very Good	Good	Very Good	Good	Good	Good
Support policies	(50)	( )	Good	Very Good	Very Good	Good	Satisfactory	Excellent	Satisfactory	Very Good
Technical support	(75)	( )	Good	Good	Very Good	Good	Good	Excellent	Very Good	Satisfactory
<b>Value</b>										
Value	(100)	( )	Very Good	Very Good	Good	Good	Good	Excellent	Good	Very Good
<b>Final scores</b>			<b>7.4</b>	<b>8.0</b>	<b>7.6</b>	<b>7.5</b>	<b>7.5</b>	<b>8.6</b>	<b>7.0</b>	<b>6.8</b>

## Use your own weightings

## to calculate your score

\* List price; retail price may be lower.

<sup>1</sup> Includes 8 megabytes of RAM standard.<sup>2</sup> Current list prices. Prices and final scores may not match original comparison.<sup>3</sup> Original 162-megabyte hard disk discontinued; both prices include 330-megabyte ESDI drive.<sup>4</sup> Replaces model PCC 2401/33.

## GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions. Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

**Excellent** = 1.0 — Outstanding in all areas.**Very Good** = 0.75 — Meets all essential criteria and offers significant advantages.**Good** = 0.525 — Meets essential criteria and includes some special features.**Satisfactory** = 0.5 — Meets essential criteria.**Poor** = 0.25 — Falls short in essential areas.**Unacceptable or N/A** = 0.0 — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

For information about InfoWorld Buyers Assurance Evals, see Report Card on Page 76.

# THE HOTTEST VALUE IN THE INDUSTRY



## NEW MINI DESKTOP 286 AND 386SX MODELS ARE BIG ON PERFORMANCE!

Sometimes the best things come in small packages. This saying definitely applies to Gateway 2000's spunky little 286 and 386SX computers. These systems now come in a space-saving mini desktop model that's sizzling with powerful new features.

The motherboard in the 286 and 386SX systems was custom-designed and manufactured for Gateway 2000 using ASICs (Application Specific Integrated Circuits) to create a cleaner, more reliable board. We integrated the floppy drive controller, the video chip set and the I/O card on the motherboard, to leave five 16-bit slots open in the standard configuration. Our mini desktop systems also have a standard mouse port

(PS/2 compatible), leaving two serial ports open.

The Gateway 2000 286 system operates at 16 MHz, rather than 12 MHz, for better performance. Our 386SX is available as a 16 MHz or a 20 MHz system. The 386SX-20 includes a 32K cache, which makes this system another truly outstanding Gateway price/performer.

## HOT-PERFORMANCE 386 AND 486 SYSTEMS ARE IN ICY GRAY CURVILINEAR MODELS

Although Gateway's 386 and 486 systems look entirely new, we limited changes on the inside to fine-tuning performance and reliability. In the Midwest, we firmly believe in the adage, "If it ain't broke, don't fix

it." And these award-winning, price/performance systems definitely did not need fixing.

All 386 and 486 systems include a fast and reliable IDE (Integrated Drive Electronics) hard drive with built-in cache. For added reliability and lower RF emissions, we've incorporated ASICs in the design of our motherboards whenever the change improved cost/performance. Because our 386 and 486 computers already include the fastest, most reliable video card on the market, the only way we could improve video performance was to increase the size of video RAM. So we did. All Gateway 2000 386 and 486 systems come standard with 1 MB video RAM. We also made our new Crystal Scan 1024NI color monitor standard with these systems. The 1024NI is non-interlaced, giving you a flicker-free video

### 16MHZ 286 VGA

- Intel™ 80286 Processor
- 2 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 40 MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 512K
- 14" Crystal Scan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 1 PS/2 Mouse Port
- 101 Key Keyboard
- MS DOS™ 3.3 or 4.01

**\$1395**

### 16MHZ 386SX VGA

- Intel 80386SX Processor
- 2 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 40 MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 512K
- 14" Crystal Scan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 1 PS/2 Mouse Port
- 101 Key Keyboard
- Microsoft™ Mouse
- MS DOS 3.3 or 4.01
- MS Windows™ 3.0

**\$1595**

### 20MHZ 386SX CACHE

- Intel 80386SX Processor
- 32K Cache RAM
- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 80 MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 512K
- 14" Crystal Scan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 1 PS/2 Mouse Port
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

**\$1995**

### 25MHZ 386 VGA

- Intel 80386 Processor
- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 80 MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

**\$2295**

### 25MHZ 386 CACHE

- Intel 80386 Processor
- 64K Cache RAM
- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 80 MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

**\$2595**

# INDUSTRY JUST GOT EVEN HOTTER!

display with up to 1024 x 768 resolution.

When our 25 MHz 486 dropped below \$4,000, it was the hottest value coming to high-end technology. Now Gateway's new 33 MHz 486 - fully loaded - is priced at \$3,995! You'd be hard pressed to find a loaded 386 for this price anywhere else. With either 486 system, you get Intel's 486 processor with built-in math coprocessor and 8K cache.

## INTRODUCING THE AWESOME ANYKEY™

We call our new 124-key programmable keyboard the AnyKey because any key can be programmed to perform any function - anything you can imagine, quickly and easily. Or you can

remap the keys to create own keyboard layout. It's a revolutionary new concept designed to let you talk to your personal computer in a very personal way.



The AnyKey includes a numeric pad and a separate, full-function cursor pad with diagonal keys, plus two sets of function keys located along the top and left side. The AnyKey's versatility is rivaled only by its simplicity. You can learn to program it in minutes. The AnyKey keyboard is an option with all Gateway 2000 computer systems.

## BETTER-THAN-EVER VALUE

Possibly the most dramatic news about our new product line is price. When a manufacturer introduces a new product line, you expect to see an eruption of price hikes. But then you've come to know Gateway is not like most manufacturers. Prices on systems in our new line are better than ever. And that goes for quality and service too, making the hottest value in the industry even hotter.

## EXPANDED SERVICE HOURS

We've also expanded our telephone technical support hours to provide you with even more flexibility and better service. We're here to help you from 6 a.m. to midnight weekdays and 9 a.m. to 2 p.m. Saturdays.

## LOOKING AHEAD

The introduction of our new product line represents almost a year of design and engineering. But it's just one phase in a process of continuous improvement that we employ at Gateway. Each day, Gateway 2000 employees come to work with one primary goal in mind: to provide you with better prices, performance, quality and service. We're committed to making Gateway 2000 the only logical choice in microcomputers.

We'd like to thank our customers for their valuable contributions to the redesign of our product line. It was our customers' suggestions and comments that gave us our direction.



**GATEWAY2000**

Have you noticed the difference?

### 8MHz 386 CACHE

- Intel 80386 Processor
- 64K Cache RAM
- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 200 MB 15ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024N1
- 14" Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

**\$2995**

### 25MHz 486 CACHE

- Intel 80486 Processor with Co-Pro and 8K Internal Cache
- 64K Cache RAM
- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 200 MB 15ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024N1
- 14" Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

**\$3495**

### 33MHz 486 CACHE

- Intel 80486 Processor with Co-Pro and 8K Internal Cache
- 64K Cache RAM
- 8 MB RAM, Expands to 64 MB
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 200 MB 15ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024N1
- 14" Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
- MS Windows 3.0

**\$3995**

**8 0 0 - 5 2 3 - 2 0 0 0**

610 Gateway Drive • N. Sioux City, SD 57049 • 605-232-2000 • Fax 605-232-2023

# How We Test

Continued From Page 76

measured against all servers we have tested.

To receive a good score in speed, a system must nearly equal or better the average time within its class. Units that perform well above the average receive very good scores; the fastest units earn excellent scores. Systems that perform well below the median receive satisfactory scores. None of the units we evaluated received poor scores.

**Compatibility:** All systems were flawless in both software and hardware compatibility.

**Expandability:** To earn a satisfactory score in this category, a 386 computer must be capable of having 4 megabytes of RAM installed on the motherboard (or nonoptional system memory board); must support up to 16 megabytes of RAM in the system; and must have at least four slots free after our test configuration. It also must have at least two drive bays open after configuration. We raise the score for additional slots, mounting bays, or memory support.

## SERVICEABILITY:

**System design:** We carefully examine systems to see how well they are designed and constructed. We award a good score to systems that follow standard design and manufacturing practices.

**Support policies:** A one-year warranty covering parts and labor, and unlimited (but not toll-free) technical support result in a satisfactory score. We award bonuses for unconditional money-back guarantees; on-site service warranties included in the purchase price; extended support hours; bulletin board support (e.g., on CompuServe); and a toll-free number. We subtract points for no technical support or a limited support period.

**Technical support:** We score this category based on a survey of our readers who buy and use desktop computers from the vendors we have reviewed. Our readers score those companies for which we receive a statistically valid sample; for lesser known vendors, we continue our practice of making a series of calls to

determine the quality of technical support.

## VALUE:

Value scores reflect the price vs. the performance and features of each machine, taking into account the competition. "Street price" is often much lower—typically 20 to 30 percent off list price depending on the channel, number of units being purchased, and numerous other factors.

This comparison was developed by Andre Kvitka, Test Operations Supervisor; Gregory S. Smith and Nicholas Preteley, Test Development Specialists; and Tracey Capen, Associate Reviews Editor.

## FEATURES

	Acer 1100/33	CompuAdd 333	Everex Step 386/33	Gateway 2000 386/33C	Leading Edge 93/33	Mitac MPC 4000G	Northgate Elegance 386/33	Tandon 386/33	Zoss 386-33
<b>System bus<sup>1</sup></b>	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA
<b>Number of parallel ports</b>	1	1	1	1	1	1	1	1	1
<b>Number of serial ports</b>	2	2	2	2	2	2	2	1	2
<b>Number of game ports</b>	0	0	0	1	0	0	0	0	1
<b>Built-in mouse port</b>	No	No	No	No	Yes	No	No	No	No
<b>Built-in VGA</b>	No	No	No	No	No	No	No	No	No
<b>Built-in IDE controller</b>	No	Yes	Yes	No	Yes	Yes	No	Yes	No
<b>Power supply</b>	230w	230w	200w	220w	200w	300w	200w	190w	300w
<b>Memory type</b>	SIMM	SIMM	SIMM	SIMM	SIMM	SIMM	SIMM	SIMM	SIMM
<b>Chip sizes supported</b>	1MB	256K, 1MB	256K, 1, 4MB	256K, 1MB	256K, 1MB	256K, 1MB	1MB	256K, 1MB	256K, 1MB, 4MB
<b>Supports mixed sizes</b>	No	Yes	Yes <sup>1</sup>	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	No	Yes	No
<b>Alternate processor speeds</b>	8MHz	8MHz	11MHz	6, 8MHz	8MHz	8MHz	8MHz	8MHz	8MHz
<b>Keyboard lock/disable</b>	Lock	No	Lock, password	Keylock	Lock	Password	Lock	No	Keylock
<b>System lock/disable</b>	No	No	Password	No	No	Password	No	Password	No
<b>Case lock</b>	No	No	No	No	No	Yes	No	Yes	No

<sup>1</sup> Must be same size chip within a bank; can mix sizes between banks.

## EXPANDABILITY

	Acer 1100/33	CompuAdd 333	Everex Step 386/33	Gateway 2000 386/33C	Leading Edge 93/33	Mitac MPC 4000G	Northgate Elegance 386/33	Tandon 386/33	Zoss 386-33
<b>Required for Satisfactory Score</b>									
<b>Expandability Score</b>	Good	Good	Very Good	Good	Good	Very Good	Good	Good	Very Good
<b>Maximum 32-bit system RAM</b>	16MB	24MB	16MB	64MB	16MB	16MB	16MB	16MB	32MB
<b>Standard system RAM support<sup>1</sup></b>	4MB	8MB	16MB	64MB	4MB	16MB	8MB	4MB	32MB
<b>Maximum external cache RAM</b>	N/A	32K	64K	256K	128K	64K	128K	256K	64K
<b>Number of 32-bit slots<sup>2</sup></b>	N/A	2 <sup>3</sup>	1 <sup>4</sup>	1	1 <sup>5</sup>	0	1 <sup>6</sup>	1 <sup>6</sup>	2 <sup>6</sup>
<b>Number of 16-bit slots</b>	N/A	6	6	6	8	6	6	7	6
<b>Number of 8-bit slots</b>	N/A	1	1	1	0	2	0	1	0
<b>Free slots after configuration<sup>7</sup></b>	4	5	5	6	6	7	6	5	5
<b>Number of external drive bays<sup>8</sup></b>	N/A	3	3	5	3	3	4 <sup>9</sup>	3	3
<b>Number of internal drive bays<sup>10</sup></b>	N/A	2	2	0	2	2	2	2	4 <sup>11</sup>
<b>Free drive bays after configuration<sup>7</sup></b>	2	3	3	3	3	3	4	3	6
<b>Largest hard drive available</b>	200MB	676MB	630MB	677MB	650MB	210MB	1.2GB	1.2GB	1.1GB
<b>Intel and Wattek coprocessor support<sup>12</sup></b>	N/A	Combo	Combo	Combo	Combo	Combo	Combo	Separate	Separate

For discussion of expandability and other scoring criteria, see Page 91.

<sup>1</sup> Maximum RAM supported by main board or nonoptional memory daughterboard.

<sup>2</sup> Proprietary memory slot unless noted.

<sup>3</sup> One slot also works as 8-bit slot; second slot also works as 8- or 16-bit slot.

<sup>4</sup> Also works as 8-bit slot.

<sup>5</sup> Also works as 8- or 16-bit slot.

<sup>6</sup> Also works as 16-bit slot.

<sup>7</sup> Configuration comprises video adapter, drive controller(s), serial/parallel ports, memory, one hard drive (5¼- or 3½-inch), and one half-height floppy drive (5¼- or 3½-inch).

<sup>8</sup> Drive bays are 5¼-inch half-height unless noted.

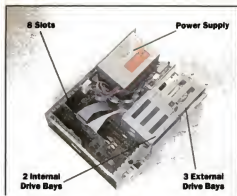
<sup>9</sup> One drive bay is 3½-inch.

<sup>10</sup> Drive bays are 5¼-inch half-height; two half-height bays will support one full-height internal drive.

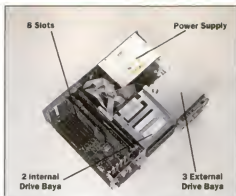
<sup>11</sup> Two drive bays are 3½-inch.

<sup>12</sup> Combination sockets hold either an Intel math chip or Wattek chip.

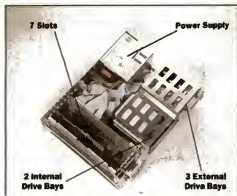
**INFO  
WORLD**



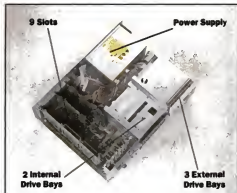
Acer America Corp.'s desktop Acer 1100/33.



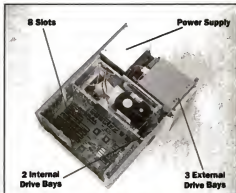
CompuAdd Corp.'s desktop CompuAdd 333.



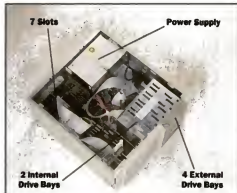
The desktop Step 386/33 from Everex Systems Inc.



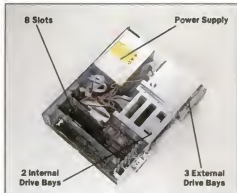
Gateway 2000 Inc.'s Gateway 2000 386/33C.



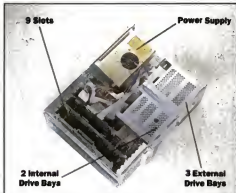
Leading Edge Products Inc.'s Leading Edge D3/33.



American Mitac Corp.'s Mitac MPC 4000G minitower.



Northgate Computer Systems Inc.'s Elegance 386/33.



The desktop Tandon 386/33 from Tandon Corp.



Zeos International Ltd.'s full-size tower Zeos 386-33.

## SUPPORT

INFO  
WORLD

	Required for Satisfactory Score	Acer 1100/33	CompuAdd 333	Everex Step 386/33	Gateway 2000 386/33C	Leading Edge D3/33	Mitac MPC 4000G	Northgate Elegance 386/33	Tandon 386/33	Zeos 386-33
<b>Support policies</b>		Very Good	Excellent	Very Good	Excellent	Good	Excellent	Excellent	Excellent	Very Good
<b>Warranty period</b>	1 year	2 years	1 year	1 year	1 year/life time <sup>1</sup>	20 months <sup>2</sup>	1 year	1 year	1 year	1 year
<b>Free on-site service</b>	No	No	1 year	1 year	1 year	6 months <sup>2</sup>	1 year	1 year	1 year	No <sup>3</sup>
<b>Money-back guarantee</b>	No	No	30 days	No	30 days	No	30 days	30 days	30 days	30 days
<b>Free vendor-supplied support</b>	Yes	Yes	Yes	Yes	Yes	No <sup>4</sup>	Yes	Yes	Yes	Yes
<b>Toll-free line</b>	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
<b>BBS support</b>	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Support hours<sup>1</sup></b>	Business hours	7a-6p, Pac	8a-7p, Cen	6a-5p, Pac	6a-12a, Cen <sup>6</sup>	8a-8p, Eas	7:30a-5:30p, Pac	24h/7d <sup>7</sup>	24h/7d <sup>7</sup>	24h/7d <sup>7</sup>
<b>Technical support score</b>		Good	Very Good	Very Good	Excellent	Satisfactory	Very Good	Very Good	Poor	Satisfactory

<sup>1</sup> One-year parts warranty; labor free for the life of the system.<sup>2</sup> Twenty-month carry-in warranty or six months of free on-site service.<sup>3</sup> Optional first-year on-site service for \$49.<sup>4</sup> Fee-based support through 900 number.<sup>5</sup> Support hours are weekdays unless noted; Cen = Central time, Eas = Eastern time, Pac = Pacific time.<sup>6</sup> Also includes Saturday hours, 9a-2p.<sup>7</sup> Provides 24 hours a-day, 365 days-a-year support.

Sometimes sharing will  
slow you down.



Now there's a new LaserJet fast enough and smart enough to keep the whole group happy. The LaserJet IIIISI printer. A 17ppm powerhouse designed for high volume. And multiple users.

With the LaserJet IIIISI, your users are up to speed the moment they give the "print" command. HP's RISC-based formatter and the PCL5 printer language, with vector graphics and on-the-fly typeface scaling, yield fast results. Even on the most complex documents.

The LaserJet IIIISI meets the demands of your shared work groups with two 500-sheet input trays, an output capacity of 500 sheets, and a monthly duty cycle of 50,000 pages. HP includes a job offset feature, a tray-full sensor, and software-selectable language switching between PCL5 and optional Adobe® PostScript®. For added versatility, you can choose an envelope feeder and two-sided printing.

HP sets a new standard for I/O

performance with optional Ethernet or Token Ring Interface cards that support Novell or

Adobe and PostScript are registered trademarks of Adobe Systems, Inc. in the U.S. and other countries.



And sometimes it'll  
get you there faster. Introducing  
the 17ppm LaserJet printer.



The HP LaserJet III Si printer.

3COM 3+OPEN. The LaserJet III Si comes with standard parallel and serial I/Os.

For all its capabilities, the fastest LaserJet printer is priced at just \$5,495.\* An exceptional value considering your users will also be getting the sharpest 300 dpi print quality yet. In fact, HP's revolutionary combination of Resolution Enhancement technology and new microfine toner challenges the print quality of many 600 dpi printers.

If you're ready to hook your users up without slowing them down, call 1-800-752-0900, Ext. 2134 for more information on the LaserJet III Si and the name of your nearest authorized HP dealer.

**HP Peripherals**  
When it's important to you.



## Disk Caching: Putting High-Speed RAM to Work

It's not always necessary to move to a faster CPU in order to improve your PC's performance. A less-expensive upgrade is to add hardware- or software-based disk caching.

We tested both software and hardware disk caching products with our standard throughput test suite to determine the relative benefits of cache vs. no cache and software- vs. hardware-based cache. Software-based caching products included Microsoft Corp.'s SmartDrive (typically bundled with Windows 3.0) and Multisoft Corp.'s Super PC-Kwik. For hardware-based caching, we tested caching hard disk controllers from Adaptec and UltraStor Corp., plus a Quantum Prodrive SCSI hard disk with built-in cache.

**WAITING ON THE HARD DISK.** Disk caching is a way to bridge a PC's high-speed CPU with its comparatively slow hard disk. When the CPU requests data and cannot find them in system memory, the CPU must wait while the information is located on the hard disk and copied into RAM. By a CPU's speed standards (millions of cycles per second), this process is extremely slow. (A hard disk typically works in milliseconds or one thousandth of a second. RAM chips work in nanoseconds, or billionths of a second.)

Disk caching is based on the theory that the more often the CPU finds what it

Software caches are inexpensive (under \$50; in fact they are frequently bundled with other applications) and usually easy to install. Software caching takes a chunk of system RAM and dedicates it as RAM cache work space. The downside of software caching is that it uses your system RAM and it can conflict with applications that have built-in caching.

Hardware-based disk caches — typically found on specific hard disks and hard disk controllers — make use of on-board or embedded memory. Although they are relatively expensive — typically \$500 to \$1,000 — hardware caches are transparent to applications and, as a consequence, rarely cause conflicts with application caches. On some disk controllers, cache RAM is built onto the board and cannot be expanded. Other models use standard SIMM panels and RAM capacity can range typically from 1 to 16 megabytes.

Most hardware caches have a read-only cache (as opposed to a read/write cache) that optimizes CPU data requests. Once the requested data have been passed to the CPU, the disk caching controller decides which sectors or tracks to retrieve and place into the cache. This operation is transparent to the system — the processor and main memory continue with their tasks while the disk controller pulls the data into its cache.

**PUTTING DISK CACHING TO THE TEST.** To test disk caching, we used a 25-MHz Compaq Deskpro 386/25 with a math coprocessor, 16-bit VGA, 4 megabytes of RAM, a 130-megabyte ESDI Miniscribe hard disk, and a Western Digital controller. (Both the drive and controller are standard Compaq equipment.) This typical ISA machine has no built-in controllers.

We tested PC-Kwik and SmartDrive with 1 megabyte of dedicated system RAM. We also tested SmartDrive with an additional megabyte of RAM to see if more memory improves throughput. The UltraStor controller was tested with 1 and 4 megabytes of on-board memory, and the ISA-based Adaptec has 64K of cache built in (it cannot be expanded). Our SCSI subsystem had 64K of cache built into the Quantum drive, rather than the controller.

In most cases we tested each caching product by itself. However, in one test we combined software and hardware caching products — PC-Kwik and the UltraStor controller.

Ashton-Tate's dBase IV has a built-in disk caching option that only works when the application is running. We tested each of the disk caching products with dBase IV's cache on and off.

**WHAT WE FOUND.** In our dBase III Plus and dBase IV tests, software caching was generally faster than hardware caching. With dBase III Plus, PC-Kwik provided the top boost in performance with a single cache. It was followed by SmartDrive and then the UltraStor. dBase III Plus was about 47 percent faster with PC-Kwik than with no cache. dBase III with the UltraStor and 4 megabytes of RAM was about 25 percent faster. With the same controller and 1 megabyte of RAM, dBase III Plus was about 11 percent faster.

The performance benefits running dBase IV with cache were not as impressive as dBase III. With a single cache, PC-Kwik again provided top performance.

Our dBase IV test ran approximately 13 percent faster. PC-Kwik was followed by dBase IV's own cache and SmartDrive. Our Paradox throughput had the same pattern as the dBase tests — with the exception of SmartDrive, which is not compatible with Paradox. With PC-Kwik, our Paradox test ran about 36 percent faster.

In all three test suites, combining software and hardware disk caching gave the top performance boost. Paradox, with the largest difference, ran 48 percent faster with the UltraStor controller and PC-Kwik installed.

When PC-Kwik was loaded with the 4-megabyte UltraStor configuration, cache performance was at its best. It showed that the combination of hardware and

software caches together can really increase speed. To establish a suitable environment, it is important to try different cache configurations together. Our standard Windows test suite is more CPU intensive rather than disk intensive. Consequently, the throughput results were inconclusive.

In addition to SmartDrive and Paradox, we had a few other compatibility problems during testing. In our Windows test, SmartDrive was not compatible with our SCSI subsystem. For Windows, Microsoft recommends loading SMARTDRVSYS at 512/512 (512K) to make the SCSI drive work.

dBase IV's built-in caching program, Hyperdisk, would not run with PC-Kwik. — Patrick Lyons

### BENCHMARKS

### INFO WORLD

### Disk Caching Speed Scores

Test times in minutes:seconds. Lower times indicate better performance.

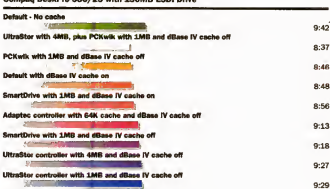
#### dBase III Plus

Compaq DeskPro 386/25 with 130MB ESDI Drive



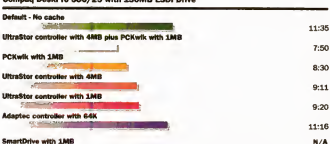
#### dBase IV

Compaq DeskPro 386/25 with 130MB ESDI Drive



#### Paradox 386

Compaq DeskPro 386/25 with 130MB ESDI Drive



## Combining software and hardware disk caching gave the top performance boost.

needs in RAM instead of on disk, the more efficient it will be. This translates into better overall system performance. Whenever the CPU requests data from the hard disk, a disk caching scheme uses an educated guess as to what the CPU will want next and transfers that information into the cache RAM. If the disk cache program is well designed, the chances are very high that the CPU will find its next request in the cache.

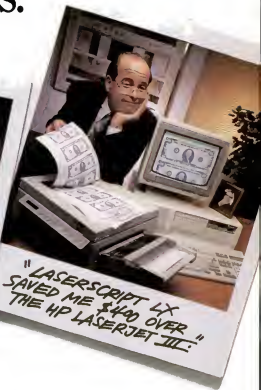
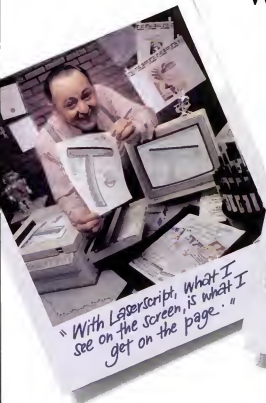
The efficiency of disk caching is measured by the ratio of cache hits (when the CPU finds the requested data in cache) to misses (when the system must go to the hard disk). The size of the cache must balance with the task at hand. Often a cache can be too big or too small, depending upon the application. For example, if a cache is too small there will be a high frequency of cache misses. This can be worse than no cache, because the system wastes time checking the cache first to see if the desired data are there.

When a cache is too large, the data requested may be in the cache, but the size of the cache forces your PC to spend more time looking through the RAM to find it. But a cache hit in an overly large cache is still better than a cache miss.

#### HARDWARE VS. SOFTWARE DISK CACHING.

Although hardware and software disk caches have similar schemes for improving performance, they differ in the location of the cache RAM and price.

# Our PostScript-compatible printer offers big opportunities for people who do Windows.



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Only one port active at a time  
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# IMPRESSIONS



**FIRST LOOK** ■ BY MICHAEL J. MILLER

## Revamped Harvard Graphics Gives Greater Drawing Control

With Harvard Graphics 3.0, Software Publishing has taken its best-selling graphics package and made it easier to enhance charts and create presentations. It has accomplished this by adding icon-based drawing modules and new presentation features, in addition to updating Harvard Graphics' overall capabilities.

In Harvard Graphics 3.0, the drawing portion has been almost completely revamped. When you are ready to edit or annotate a chart, you simply hit the F4 key to switch directly into an icon-based drawing environment. With its dependence on the mouse and icons, the drawing view resembles those found in many Windows programs, which is a departure from the rest of Harvard Graphics.

As in previous versions of Harvard Graphics, you can add text, lines, arrows, boxes, polygons, etc. on top of a chart, or insert various symbols. But you now have a lot more control over the individual objects in the drawing. You can align, flip, or rotate objects. Drawing is made easier in this version with such tools as bezier curves, a zoom feature, and rulers. You can even create several objects with a transition between them, creating an on-screen animation effect. On the graphics side, the program can read PCX, TIFF, and CCM files. You can also export (but not import) Encapsulated PostScript files.

The program's presentation tools have also been significantly enhanced. Previous versions let you create a "Hyper-show" by combining multiple slides into a presentation, setting up transitions between slides, and even linking slides with buttons. However, Version 3.0's new global presentation options make it much easier to create a consistent presentation.

To begin with, whenever you create and save a chart, the program asks if you want to add to it by your existing presentation. It also lets you add speaker notes to your presentation. Most important, you

can now give all of the slides in your presentation a consistent look by selecting a common title, subtitle, and footnote; by giving all titles and footnotes a consistent style; and by adding a standard background or color palette.

Harvard Graphics' global presentation options are not as powerful as the capabilities we've seen in some Windows or Mac packages (such as a master set of multiple matching templates), but they are a big step in the right direction.

While drawing and presentation features have received the most attention in this release, the program's charting features (the bread and butter for most users) have not been ignored. The program now has a table chart feature that is very useful when presenting spreadsheet-type data, and the maximum number of data points in a chart has been increased to 1,000. Version 3.0 also lets you change the shape of the bars in bar charts to pyramids, octagons, and cylinder-shaped bars.

One feature that makes life easier is the capability to define a section of a chart and modify all attributes — such as the title, data, legend, or footnote — without losing links to data. In addition to importing ASCII files, and Lotus and Excel charts and data, Version 3.0 now imports dBase files.

Harvard Graphics' color capabilities have also been upgraded. The previous version's 16-color palettes have been replaced by 32 predefined palettes of up to 64 colors each. Version 3.0 supports color blending (HSB and RGB), and you can either create custom palettes or substitute colors in an existing palette.

Font support now includes Bitstream Speedo scalable type faces — a big improvement over the bit-mapped fonts used in previous versions. Harvard Graphics is still a big program, taking up over 11 megabytes of hard disk space with all of its options installed.

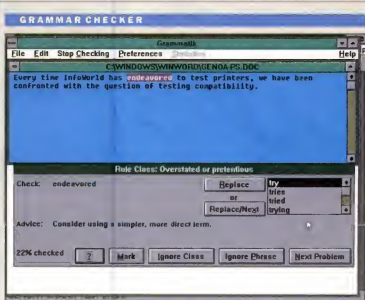
All in all, Harvard Graphics 3.0 is a big step forward in taking this product's popular charting features and adding

competitive drawing and desktop presentation capabilities. The drawing module is much more competitive with Lotus Freelance (which historically has had better drawing tools). Harvard Graphics' presentation features are fine, but not as good as some of the GUI packages that are out or announced. Software Publishing has announced it is working on a Windows version, but it is still six to nine

months away. Harvard Graphics 3.0 costs \$595; upgrades cost \$125.

Software Publishing Corp., 1901 Landings Drive, P.O. Box 7210, Mountain View, CA 94039-7210; (415) 962-8910.

*First Look examines new personal computer products before they have been through a formal review.*



Grammar has a standard Windows-compatible interface. Its grammar checking controls are easy to use and nicely designed.

## Grammatik 2.0 Makes Grammar Checking A Breeze With Updated Rules, Style Guides

Reference Software has recently released an updated version of Grammatik for Windows, and it is fantastic. This version's new rules and style guides strengthen its document proofing capabilities. Grammatik 2.0 is now much easier to use, which makes grammar checking a simple process.

I have been using Grammatik with Word for Windows, and I love it. It does a fine job of smoothing out my rough prose, continually making suggestions that make my writing easier to read and grammatically correct. Implementing support for user-spelling dictionaries is a great idea. Grammatik now recognizes all additions I have made to my user dictionary, and won't flag names and other special words.

What really sells me on Grammatik is its implementation. The product is installed with a Word for Windows README file. The file launches a macro that installs Grammatik as a menu option off my utilities menu. Installation involved opening the document in Word, then double-clicking on the install button. Grammatik can also be installed for Ami Professional as a Tools menu option.

Grammatik's best quality is its ease of use. To check a document you choose

Grammatik and the installed macro takes control. First the macro closes down Word for Windows, opens Grammatik with the document I was editing, and begins the grammar check. Once I have made the changes, the macro automatically saves changes and suggestions to the document (if I choose), and upon exiting reopens Word with my document on-screen. Grammatik is slick and makes grammar checking a no-brainer.

My only complaint with Grammatik is its speed. I realize that Windows is the primary culprit, but I must warn you that running under Windows, Grammatik won't break the sound barrier and may push you to your limit.

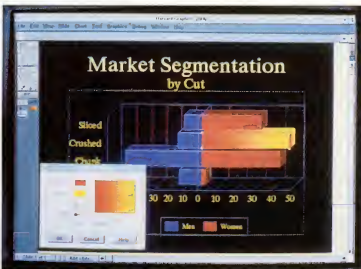
Grammatik for Windows is impressive. It works wonders at improving your writing, installs easily, and its implementation is top notch. For \$99, Grammatik is a bargain.

Grammatik Windows 2.0 requires Windows 3.0 or later.

Reference Software, 330 Townsend St., Suite 123, San Francisco, CA 94107.

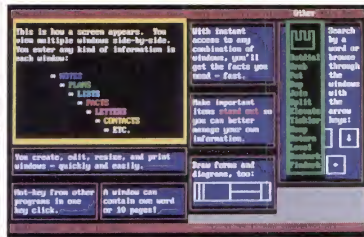
— Jeff Eckert

*Impressions are brief looks by InfoWorld staff and reviewers at newly announced and released products.*



Harvard Graphics' redesigned drawing screen features Windows-like pull-down menus and mouse control, and improved drawing and editing tools.

## PERSONAL INFORMATION MANAGER



MicroLogic Corp.'s upgraded Info Select gives users some of what they found in more powerful PIMs, but with greater ease of use.

## For Tornado Notes Fans, Info Select Personal Information Manager Improves an Old Favorite

**R**emember Tornado Notes? That product used to be my main standby for jotting down on-the-fly personal information, especially when on the phone. It was RAM resident, and you could get in and out rapidly.

Tornado's most serious drawback however, was its limited storage capacity: If you had a few too many telephone contacts during the day, you'd run out of room for notes. MicroLogic, the makers of Tornado, solved this problem last year with the introduction of Info Select, a more PIMlike update to the Tornado product. Now they've come out with a major update to Info Select that's especially worth a look for Tornado fans.

The new Info Select features a LAN option and some LAN-specific extras, including LAN-user documentation and copying and sharing of LAN stacks. (The

product is not, however, set up to focus on calendar/scheduling as are many workshop schedulers.) Updated features include mail-merge capabilities, a "remove duplicates" option that prevents you from storing the same information twice, advanced sorts, and "best fit" searches (to complement exact match searches).

The product is keystroke compatible with previous versions of Info Select and Tornado Notes, which I really like about it. If you shudder at the high-end, overloaded PIMs, and like getting in and out fast, take a look at the new Info Select. It lists for \$149.95, and can be loaded RAM resident.

MicroLogic Corp., P.O. Box 70, Dept. P. Hackensack, NJ 07602; (201) 342-6518.

— Sebastian Rupley

## HAND SCANNER

## Migraph's Smooth, Swift CS-4096 Color Hand Scanner Is Worth a Second Look

**I**f you're looking for a color hand-held scanner to import images into your desktop publishing, database, or presentation package, Migraph Inc. offers the CS-4096 color hand scanner. For \$895, the software included with the Migraph hand scanner offers significant advantages over that bundled with the DFI CHS-4000 and GeniScan GS-C105 Plus that *InfoWorld* compared on April 29 (Page 51).

The CS-4096 is a 4-inch 12-bit color scanner capable of 256-level gray scale and 4,096 colors, and 100-to-400-dpi-per-inch resolution. It comes with three software programs — CS-4096 Scanning Utility, Picture Publisher Plus, and Image Prep — that run in Windows 3.0 real mode. The new version, due in June, also runs in standard and enhanced modes. You need at least a 286 or compatible machine with 2 megabytes expanded or extended memory (4 megabytes recommended), Windows 3.0, a VGA graphics card, and a VGA color monitor.

The CS-4096 has a good grip on the scanning surface, and tracks and rolls easily. You won't lose data by getting ahead of the scanner's capabilities with its good scan speed. It has limited video card driver support, but the new version will take advantage of color Windows VGA drivers.

The CS-4096 Scanning Utility performs basic scanning, manipulating, and viewing functions; however, only the last scanned image can be viewed in the utility. You will need a memory manager to run the Scanning Utility.

The Scanning Utility currently saves images in a proprietary CPI TIFF (types R, P, and B) and PCX format, but you will be able to save images in Windows bit maps with Version 1.5. The image quality on-screen as well as in TIFF format is good at 256 colors and 640-by-400



The CS-4096 color hand scanner has a digital display for the resolution setting and scans up to 4,096 colors.

resolution, and you can adjust images outside of 4,096 and 256 color scan types, such as dithered and line art.

I wasn't able to scan my image without first going into the utility's Setup and specifying a scan length. This step wasn't documented, and I had to call technical support for help.

Picture Publisher Plus is a 24-bit editor that offers image editing, retouching, painting, and color enhancement. This software isn't exactly intuitive, but examples in the manual are helpful.

You can bypass Picture Publisher and just use the Image Prep software to edit, manipulate, and convert your image. Image Prep is capable of image processing, converting color to gray scale and black and white, as well as dithering. You can also adjust the brightness and contrast, gamma control, balance, and color.

Migraph Inc., 200 S. 33rd, Suite 220, Federal Way, WA 98003; (800) 223-DRAW.

— Siobhan Nash

## MONITOR

## Nanao's 90801 Multiscanning Monitor Provides Clear, Crisp Display Quality

**I** have been working with Nanao's 16-inch 90801 multiscanning monitor for the past few weeks and abhor the thought of giving it up. The 90801 works well with Windows: The display is clear at most resolutions, it works in a variety of modes, and makes working in the environment more efficient.

I found the display quality of the 90801 best at 800-by-600-pixel resolution. Text was crisp, and display geometries were free of any distortion. However, when working at 1,024 by 768, the 90801 exhibited peripheral focus problems in the corners and along the extreme borders. PageMaker 4.0 text was too fuzzy to work with. I won't condemn the 90801 for this; sometimes monitors receive a beating in shipping that causes the scan guns to be knocked out of alignment. (It is always wise to check out your monitor before purchasing or signing for it.)

With 90-hertz vertical and 64-MHz horizontal scanning rates, the 90801 is capable of 1,280-by-1,024-pixel resolutions (1,024 by 768 is recommended).

Nanao uses a non-glare coating that is effective, and I like the dark, black tube used in the 90801. Nanao has also implemented VLF radiation control via a special yoke and sealing that conforms to the Swedish government's standards.

Controls for the 90801 are on the front of the monitor and are easy to use. I liked the Nanao's implementation of intelligent digital control that stores up to 27 different picture adjustments: When you change video from one mode to the next — for example, from 1,024-by-768 to 800-by-600 mode — your preset screen configuration, which is stored in a microprocessor, is called and the display is configured to the preferences you have set for that video mode. This does away with fussing with horizontal size and placement whenever you switch video modes.

For \$1,889 the 90801 stacks up well against most 16- and 17-inch displays.

Nanao USA Corp., 2335 Telo Ave., Torrance, CA 90505; (313) 325-5202.

— Jeff Eckert



The Nanao 90801 color monitor features a non-glare coating, 1,280-by-1,024-pixel resolution, and radiation control.

# BUYER'S ADVISORY

**ANSWER LINE** ■ By BRETT GLASS


## How Does Your AUTOEXEC.BAT File Know What Time It Is?

**Question:** I would like to put a routine in my AUTOEXEC.BAT file that will check the time and run a certain routine based on that time.

George Herman

**Response:** When I confronted this problem, I solved it by writing a 10-byte (yes, byte!) program to test the hour within a batch file. Here's how to reproduce it. Copy the following text, verbatim, into a file called HOUR.SCR. Then type the command DEBUG < HOUR.SCR at the DOS prompt. A program file, HOUR.COM, will appear in the current directory:

```
N HOUR.COM
E100 B4 2C 2D 21 8B E8 B4 4C 2D 21
R CX
A
W
Q
```

When you run HOUR.COM from inside a batch file, it sets ERRORLEVEL to the current hour of the day (0 for midnight, 1 for 1 a.m., and so on up to 23 for 11 p.m.). You can then use the IF ERRORLEVEL statement to see if it's later than a certain hour of the day. For instance, the line IF ERRORLEVEL 21 BACKUP will perform the command BACKUP if it's 9 p.m. or later. Use IF NOT ERRORLEVEL to see if it's earlier than a certain hour; for example, if NOT ERRORLEVEL 8 BACKUP will do a backup only if it's before 8 a.m. To test for a time in a range of hours, use both together. The sequence

HOUR

IF NOT ERRORLEVEL 9 GOTO NO  
IF ERRORLEVEL 10 GOTO NO  
BACKUP

will run BACKUP only if it's between 9 a.m. and 10 a.m. One final note: When writing your batch files, make sure to run HOUR just before each IF ERRORLEVEL test (or group of tests) that relies on it. Why? Because external DOS commands, and all DOS programs, reset ERRORLEVEL when they run.

**Question:** I have a 386 with a Logitech mouse. I've installed Windows, and the mouse only controls the arrow on the screen about 15 percent of the time. Eighty-five percent of the time, when I move the mouse the arrow just stays put; sometimes it doesn't appear at all.

Chuck Buckley, California

**Response:** Logitech gives the following advice about using its mice with Windows. First, the company recommends using its latest driver: Version 5.0.1. If you have an older version, you can download the new one from Logitech's BBS at (415) 795-0408. The file names are MOUSE501.SYS (for AUTOEXEC.BAT) and MOUSE501.SYS (for CONFIG.SYS); you should also download both together as the compressed file DRV501.ZIP.

Second, run Setup and make sure you've set Windows for a Logitech serial mouse. If you've picked any of the Microsoft models, you're likely to have trouble.

Third, if you're running in 386 Enhanced mode, double-click on the 386 Enhanced icon in the control panel. In the

box marked Device Contention, make sure that the serial port you're using for your mouse is set to Never Warn.

Finally, some serial cards that use a chip bearing the name Winbond do not work properly with a serial mouse. If you have an adapter with this chip, try swapping it for another.

One more tip, if like me, you happen to have an old Logitech R7 mouse (the kind that isn't powered by the serial port), try disconnecting and reconnecting the AC adapter. This technique always works when my trusty rodent starts to act strangely.

**Question:** I have an AT 286 clone with a Sony 1304 monitor. I moved into a building that's 35 or 40 years old, and it only had nongrounded outlets. I managed to replace all the outlets I'm using for stereo and computer equipment, and they're properly grounded to a grounding rod and a water pipe. I notice a horizontal line moving up the screen on both my television and my computer. Do I have dirty power?

Tom Swett

**Response:** In a correctly installed electrical system, the neutral side of the power line — as well as all the ground pins on the electrical outlets — are connected to a common ground at the main circuit breaker. By connecting the ground pins on your outlets to a different ground, you may have created a "ground loop" — a noisy circuit that can carry substantial currents and play havoc with your electronic equipment.

My advice is to have the wiring redone properly. Besides producing intense elec-

trical noise, improper wiring can violate electrical and building codes, and void your insurance. If you're not a licensed and bonded electrician, think twice about changing the wiring in your home or office. Otherwise, the result could be fire or serious injury.

Contributing Editor Brett Glass answers reader questions on technical issues in this weekly column. Brett cannot answer questions personally and will not make brand-name recommendations. Readers can leave questions by calling (800) 227-8365, Ext. 622 or by messaging Compuserve (72667,3673).

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• **Prodigy Hardware Guide:** Full text of selected InfoWorld hardware reviews and a library of selected hardware product comparisons. Access is JUMP HARDWAREGUIDE.

• **Nexis.** Full text of news and reviews. Access is INFWLD.

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The Buyers Assurance Seal signifies that the product's manufacturer has signed a limited replacement or refund guarantee. Look for the Buyers Assurance Seal in InfoWorld reviews and product comparisons, and when shopping for PC products.



## RESOURCES

### ■ JUNE

**5, Philadelphia:** The Inside Windows 3.0 conference for corporate users. Future sites include Minneapolis, Cincinnati, and Seattle. For more information, contact: (602) 998-7500; to register, call (800) 800-3436.

**10-14, Nashville, TN:** The Usenix Association's Summer 1991 Technical Conference and Exhibition. Contact: Usenix, (714) 588-8649.

**13-14, Orlando, FL:** The fourth annual conference of the Bynet User Group. Contact: Christine Seale, (508) 480-0840, Ext. 263.

**14-19, Anaheim, CA:** The Ninth National Conference on Artificial Intelligence. Contact: AAAI, (415) 328-3123.

**18-19, Philadelphia:** The 1991 Philadelphia Computer Conference and Exposition focuses on information systems for business and government. Contact: Sylvia Griffiths, (800) 638-8510.

**19-20, New York:** The first annual conference on downsizing in the computer

industry. The conference will focus on making the migration from reliance on mainframe and distributed processing in the mini, PC, and LAN environments. Contact: (800) 345-8016.

**24-28, Santa Clara, CA:** The First Annual Windows 3.0 Developers' Conference will address topics of interest for novices and experienced Windows developers. Contact: (508) 649-9731.

**25-27, New York:** Ninth Annual PC Expo. Contact: Bruno Blenheim Inc., (800) 444-3976.

**27-29, Seattle:** Independent Computer Consultants Association's 14th annual national conference. Location: Westin Hotel. Contact: Carolyn Karelitz, (800) 438-4222.

### ■ JULY

**23-25, Santa Clara, CA:** Macivity '91: The Macintosh Connectivity Conference is a technical conference on integrating the Mac into network environments. Contact: (408) 354-2500, Ext. 463.

**24-26, Boston:** The third annual Digital

Multimedia Conference. This year's conference focuses on multimedia tool, title, and application development. Contact: (800) 874-9980.

**29-August 2, Chicago:** Image World Chicago combines Video Expo and the CAMMP Show. Contact: JoAnn Minsker, (800) 800-KIPL.

### ■ AUGUST

**14-16, Boston:** Windows & OS/2 Conference. Contact: CM Ventures, (415) 601-5000.

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# REVIEWS

**P**roject management software exacts a high price for precision scheduling and cost tracking: It's often so complex that users don't even try to learn basic functions. Symantec's Windows-based On Target, however, greatly demystifies project planning.

On Target doesn't require you to know much about project management. You just need to list tasks using a simple outline. On Target connects activities together for you automatically. Like Microsoft Project for Windows, On Target has advanced planning tools, but its understandable terms and forms make planning a more comfortable experience.

This review is based on criteria established for our mainstream project management comparison of November 26, 1990 (Page 67).

## PERFORMANCE:

**Features and flexibility:** On Target provides three basic views of your plan. The Time Table (or Gantt chart) displays an outline of tasks and duration, graphed over time. The Work Flow window (or PERT chart) shows how activities connect, as well as how they're organized within the overall plan. Lastly, a resource spreadsheet consolidates resource and cost information.

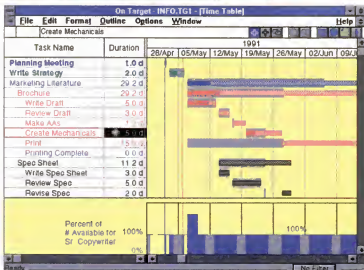
You can control the look of these windows — and the information they contain — by completing brief forms. You select the data columns to be included in the spreadsheet, for instance, or display only those tasks that meet certain selection criteria.

Although the customized options are as robust as Time Line or Project for Windows you can pick from up to 50 columns on some windows and save preferences in libraries for reuse. Additionally, task descriptions are formatted with various fonts, and bars are shown in different colors or shading. This draws attention to important situations, such as tasks that may be lagging behind schedule.

Entering a task name and duration starts a plan. On Target lets you easily change dates by dragging the task time bar until it spans the desired range. You can record more detailed information while scrolling through the Time Table's spreadsheet. Four types of floating "Info Boxes" provide another convenient way to create or edit data, such as workload assignments.

As you drag subsequent tasks into position, the Schedule Assistant help feature asks if the tasks should be connected. It also senses any ambiguous situations, so you can clarify logic before errors multiply. Furthermore, On Target provides a link tool for drawing connecting lines between tasks. Because it's targeted at the business user, On Target offers several options to execute the same functions.

The spreadsheet's outlining capabilities let you start with general task groups



Beneath the Time Table, On Target offers a histogram view that will display individual resource allocation.

## On Target Makes Project Management Accessible

Standard project manager features have more intuitive names, such as Work Flow vs. PERT.

BY MICHAEL HECK REVIEW BOARD

and fill in the details later. On Target offers a work breakdown structure (WBS) code field, but codes aren't generated automatically from the outline structure. Still, you may want to use WBS codes because they provide an important link when transferring files to other programs such as Time Line.

You can use basic subprojects with On Target through the unlimited levels of indentation. In addition, On Target combines resources or tasks from other files, so you can build a customized plan from premade projects.

The basic resource feature appoints a person responsible for each task. An advanced setting assigns multiple resources that work full or part time. In this case, cost data are calculated from how much effort resources handle, or according to manual entries. On Target accommodates prices for material resources too, by listing cost per unit such as pounds or gallons.

Within the task spreadsheet, you easily specify a starting budget and On Target calculates deviations based on the work completed to date. However, the program lacks more elaborate earned-value calculations.

You can graph certain aspects of the project, including costs per period or cumulative expenses. These appear below

the Time Table display, much like in CA-SuperProject 2.0.

On Target is also a fully networkable product, offering features such as file locking and simultaneous multiple-user support.

On Target offers ample capabilities to plan, evaluate, and track projects that are typical of many businesses. Elaborate planning features such as resource shift changes and cost options are limited. Although lacking the capabilities of some other mainstream project managers, it executes what it's designed to do very well. Features and flexibility are good.

**Rescheduling/resource leveling:** On Target staggers the start of tasks so they partially overlap, or it will add a gap that keeps following tasks from starting until specified time elapses.

You can postpone tasks until the last possible moment (known as ALAP — as late as possible — scheduling), or specify absolute starting and ending dates.

The link tool connects tasks so the next one starts only after the first finishes. You can also have tasks start at the same time. However, there is no end-to-end relationship. This causes a problem particularly when loading a Time Line plan because it supports finish-to-finish task

dependencies.

On Target provides very basic rescheduling functions: Automatic schedule calculation mode is either on or off. The program illustrates the leeway available in the schedule or for a task (total or free slack time). But there is no automatic optimization that keeps this free time to a minimum, which could result in a shorter overall schedule.

A priority number (from 0.1 to 9.9) determines the order in which tasks are scheduled if the same resource is assigned to several tasks at once. But you can't schedule a range of tasks or directly smooth out the workload of only selected resources.

A resource histogram shows days where a resource is overworked. There is not the robust interactivity that you will find with products such as Project Scheduler 5 — so you can't decide on the spot whether to have someone work overtime or add additional help.

As with the basic feature set, rescheduling and resource leveling are more than adequate for the jobs you'll likely tackle — but not at the level of other mainstream project managers. We rate On Target's rescheduling and resource leveling good.

**Speed:** With On Target, rescheduling took just 6 seconds, which compares favorably with Project for Windows and non-Windows applications such as Scitor's Project Scheduler 5.

Resource leveling took just under 15 seconds. Project for Windows is the only program tested with a faster time (8 seconds). For comparison, Time Line's resource leveling took 6 minutes.

**Switching windows and response times** when moving objects within the Time Table, such as task bars, happens with no delay. However, in the Work Flow window, moving objects is sluggish as the screen is redrawn each time you make a change. We rate speed very good.

**Reporting:** On Target, similar to CA-SuperProject, treats every screen format as a report — and there are several variations within each of the three main window types. Therefore, once you customize a window with the appropriate columns, headings, and charts you see what is going to be printed.

A number of print-out options regulate the scale or whether you want the output forced to one page. A preview option shows how each page will look when printed — a small but important point because the screen presentation is not exactly WYSIWYG. Depending on the view printed, you also select a date range and other conditions that must be met for tasks or resources to be included. Printing on a LaserJet Series II, however, was extremely slow.

You have many options to change the appearance of task bars, such as the symbols used to mark the beginning and end, line styles, if slack time shows, and

## ALSO IN THIS SECTION

DR DOS, Version 5.0 .....	91
IBM PS/2 Model 90 XP 486 SX 069 .....	93
Review Responses .....	94

how the baseline and actual schedule are depicted.

The Work Flow chart offers similar control over how task boxes are formatted. Just select the information you want included — starting date or duration, perhaps — and drag the field into position on a sample layout. An interesting feature reduces or magnifies the display in single-percentage-point increments.

A unique calendar report shows tasks in progress on certain days, so you get a real sense of how work is allocated. The calendar takes projects from the table and places them in a monthly calendar, which gives users another type of report with which to view their project.

This feature will be useful to most people. It gives the user a convenient opportunity to see a snapshot of what's going on with the project on any given day.

Reports are limited by only three sort fields and fewer financial calculations. Overall, the information is presented clearly.

Reporting receives a good score.

## REPORT CARD INFO WORLD

### PROJECT MANAGEMENT

#### On Target

VERSION 1.0

**Criterion (Weighting) Score**

#### Performance

Features (175) Good

Rescheduling/resource leveling (100) Good

Speed (75) Very Good

Reporting (100) Good

Documentation (75) Very Good

Ease of learning (100) Very Good

Ease of use (125) Good

Error handling (75) Good

Support

Support policies (50) Good

Technical support (50) Very Good

Value (75) Very Good

**Final score 6.7**

### PRODUCT SUMMARY

**Company:** Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014-2132; (408) 253-9600.

**Price:** \$399; LAN packs, \$349.

**Requires:** IBM PC, AT, or compatible with 1 megabyte of RAM; hard disk; DOS 3.0, Windows 3.0; mouse recommended.

**Pros:** Extremely simple, interactive operation; outline; nontechnical terminology; automatic task sequencing; straightforward reports.

**Cons:** Limited resource leveling and scheduling options; inflexible costing options.

**Summary:** On Target, when compared to existing project managers, may not always keep pace in the features race. However, it's an extremely enjoyable package to use and will probably satisfy the needs of many business users. Consider it a serious alternative to Project for Windows when elaborate scheduling options are not required.

### DOCUMENTATION:

On Target's documentation, like the program, is not intimidating. Two manuals, *Up & Running* and the *User Guide*, provide all the information necessary to use the program effectively, but don't slow you down with unnecessary project management theory.

The user-oriented explanations, instructions, and tips take you from creating a plan to using advanced functions — all in a logical progression. An easy reference section and strong index cap the printed material. On Target also includes complete on-line help and a fantastic computer-based tutorial. We rate documentation very good.

### EASE OF LEARNING:

On Target comes with 10 sample starter schedules that cover typical business scenarios, including product development, financial planning, special events, and retail space build-out. You can save a lot of time and learning effort by adapting these plans to your needs.

Yet On Target is fundamentally different because it doesn't rely on project management jargon such as PERT or Gantt charts. By using more descriptive concepts (Work Flow, Time Table) beginners should be able to avoid the panic attacks that are prevalent with more complicated packages.

The program's interface also simplifies learning. For instance, icons on the status bar let you pop up Info Boxes rather than searching through menus. Additionally, these quick-access buttons link or move tasks — or summarize task groups, which is called "hoisting" in On Target parlance.

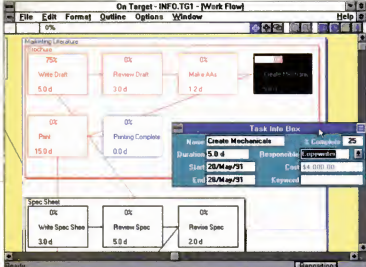
On Target's implementation of the Windows interface cuts learning time because you can intuitively move tasks, and the Schedule Assistant updates connections based on the new placement. Keyboard shortcuts are equally direct, such as Ctrl-P to print.

On Target does a fine job of opening project management up to a broad range of users. We rate ease of learning very good.

### EASE OF USE:

On Target's 12 preconfigured windows provide important insights into your plan and current progress. The Status window group, for example, provides three Time Table views: project overview, percent complete with costs, and resource issues. Windows are easily customized, saved as a group, or shared with network users.

Further, you can transfer data between windows. With a Resource and Time Table window on-screen, the Link tool



The Work Flow window (the equivalent of a PERT chart) can be zoomed to show task detail, while the Task Info Box allows you to enter information.

lets you draw a connection between several resources in one pane and multiple highlighted tasks in the other window. Other shortcuts enable you to double-click on a column and display formatting options.

Similar to Project for Windows, On Target makes extensive use of drop-down lists within forms. These let you quickly fill in fields with resource information — or construct statements that report about certain tasks. On Target has built-in filters for each task category; one possibility highlights tasks that are running late or over budget.

As you move task bars with the mouse, a status window follows along, indicating precise dates; there's no need to fine-tune duration in the Timing Box.

Though it is simple to operate, On Target's underlying capability is far from basic. Resources can work according to individual calendars (but you can't control when a resource starts working on a task).

On Target saves a reference schedule and displays it along with the actual plan. Task bars indicate the percent complete — which is entered manually or calculated as of the current date, assuming tasks are on schedule. In addition, the program estimates remaining costs and duration.

The Work Flow chart can be somewhat confusing. The links drawn between tasks may cross through an unrelated task, and many lines overlap to produce chaotic connections. Printing and reprodu-

tioning Work Flow elements are also slow. We rate ease of use good.

### ERROR HANDLING:

The Schedule Assistant alerts you to potential logic errors, and other message boxes cover file import or export troubles. Mistakes when defining filters should be rare because On Target provides a list of simple rules, such as "date is on or after." The program, additionally, checks dates for the proper range and other fields for valid input. We rate error handling good.

### SUPPORT:

**Support policies:** Symantec offers unlimited technical support from 6 a.m. to 5 p.m. Monday through Friday, Pacific time. Symantec offers fax and BBS support, in addition to corporate-extended policies. We rate support policies good.

**Technical support:** We didn't have any trouble contacting members of the support staff, and they were very familiar with the product, even though it's relatively new. Technical support is very good.

### VALUE:

At \$399, On Target is the most economical of the mainstream project managers, except for the original InstaPlan. On Target fills a void between the simple time-line charting packages and more elaborate offerings such as Project for Windows and Project Scheduler 5. On Target, with direct Time Line data transfer (although not all data types), also works as a good front end to this popular program — and in some cases can substitute for Time Line completely.

On Target doesn't promise everything. You can't track multiple projects — or perform intricate resource scheduling. However, On Target is a significant product because it simplifies planning while maintaining features that most business users will find useful. On Target is a very good value.

**Mike Heck** is manager of Electronic Promotions for Unisys Corp. of Blue Bell, Pennsylvania. He oversees desktop production of marketing literature, and specializes in project management, graphics, and word processing applications.

### BENCHMARKS

## Mainstream Project Management Software

	OnTarget Version 1.0	CA- SuperProject Version 2.0	Microsoft Project for Windows Version 1.0	TimeLine <sup>®</sup> Version 4.0
<b>Reschedule time</b>	0:06	2:01	0:02	0:21
<b>Resource leveling</b>	0:15	6:14	0:08	5:59
<b>Switch views</b>	0:01	0:02	0:02	0:35

All times in minutes-seconds.

Testing performed with 500 tasks on a 12-MHz IBM AT compatible with 640K of RAM, 2 megabytes of EMS, a 40-Megabyte hard disk, a VGA display controller, and MS-DOS 4.1.

<sup>1</sup> Reviewed March 11, Page 68.

<sup>2</sup> Reviewed November 26, 1990, Page 67.

INFO  
WORLD

# DR DOS 5.0 Adds Value to Compete With the Leading Brand

Update's features include a graphical shell and the capability to handle 2-gigabyte disk volumes.

By BRETT GLASS, CONTRIBUTING EDITOR

Digital Research Inc.'s DR DOS 5.0 is based on the theory that if you can't beat 'em by being different, you can beat 'em by adding more value. In this case, DR DOS addresses the basic operating system found in nearly every PC in use today.

DR DOS is a Microsoft DOS (also sold as IBM PC-DOS and Compaq DOS) clone that provides the look and feel of standard DOS, but with more capability and ease of use than either MS-DOS 3.3 or 4.01. In fact, for the average PC user, DR DOS may represent the only viable alternative to Microsoft's PC operating system stranglehold.

## FEATURES:

DR DOS 5.0 sports many new commands, command enhancements, and help facilities. It includes MemoryMax, a memory management utility that moves the operating system, TSRs, and special drivers above 640K. DR DOS' ViewMax, a graphical user interface, lets you run applications, organize files, or execute DOS commands from the keyboard or with a mouse. A disk-caching utility is also included in the package.

A DR DOS feature that may appeal to laptop users is BatteryMax, a utility that allows the operating system to shut down parts of the laptop when it's idle for a long period of time. There is, however, a catch: BatteryMax requires a hardware-specific driver and special books into the BIOS in order to work. DR DOS users will not get any message out of this feature unless the laptop vendor has built in the BatteryMax driver.

A welcome addition to Digital Research's DOS is the capability to handle disk volumes up to 2 gigabytes. (MS-DOS 4.01 supports volumes larger than 32 megabytes, but with DR DOS you do not have to use the Share command.)

**Command enhancements:** Digital Research has added several enhancements to the standard DOS commands. If you type "/"H" after many commands, DR DOS displays help screens. Unfortunately, this only works with the less frequently used

external commands. There are no help screens for the internal commands (such as Dir, Copy, and Del) that often have a number of confusing options. (Internal commands are built into the operating system. External commands such as FORMAT and MORE are separate DOS command files.)

DR DOS has extended the /P (pause) switch to a variety of commands such as Type, Tree, and Xdir. This eliminates the need to use MORE.COM for viewing long text files from the command line.

DR DOS' Chkdsk (check disk) can recover deleted directories, mark bad blocks, rebuild damaged FAT tables, and restore the root directory. It adds a /A switch to display the amount of free memory without scanning the hard disk.

Comp (compare) can display differences between files in ASCII as well as hexadecimal.

Xcopy can automatically copy system files, and if you add the /C switch, the operating system will ask for confirmation before copying. You can also use the /C option with Dir and W or /P switches, and these switches will be saved as the default.

The Sys command can install system files on disks that already contain user files by shifting files around to make space. Tree can give you a graphical representation of your disk, as well as the number and total size of the files in each directory.

Finally, in a departure from the standard MS-DOS convention, Fdisk takes over the job of formatting hard disks. This makes it less likely that you will accidentally reformat your hard disk. The Format command is still around, but it only works on floppy disks. Adding a /D switch to Fdisk lets you delete unknown partitions on hard disks (e.g., an OS/2 partition).

**New commands:** DR DOS has added a number of new commands to the standard set included with MS-DOS. Two are especially helpful for laptop users: Cursor and Filelink. The former creates a software-generated cursor that's much easier to see than the standard one. The latter command is a file transfer utility

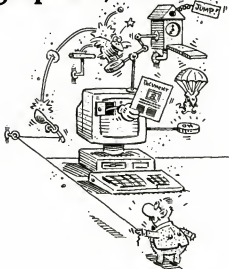
that lets you exchange files between your desktop machine and a laptop through the serial ports.

New file management commands include Delq and Erase. These commands work like Del and Erase but ask for confirmation from the user before removing files. If you use wild cards, DR DOS

will ask for confirmation, file by file. Xdel can remove entire directories and their contents in a single step. Xdir is an enhanced Dir command that lets you sort files by date, time, or size. It can also display hidden and system files.

DR DOS gives you password protection with the Password command. You

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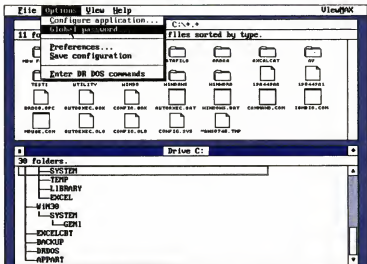
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DR DOS 5.0's graphical user interface — ViewMax — provides icon or tree views of files. Password protection can be applied to single files or globally.

can make a file inaccessible unless its name is followed by a semicolon and a password that's unique to that file. You can also assign a global password.

There are, however, two problems with DR DOS' security scheme. First, many applications will not allow you to enter a semicolon with a file name, effectively shutting you out from password-protected files. Second, and more important, the protection is not very strict. We were able to remove protected files with Norton Utilities, and we could remove password protection from any file just by changing 5 bytes in its directory entry (again with Norton Utilities).

One extremely useful enhancement in DR DOS is the addition of interactivity and branching to CONFIG.SYS. An ECHO and \*\*\* command in CONFIG.SYS prints a message and a question mark, and prompts for a yes/no response. It then executes or skips a command based on your answer. There is also a Chain

command that lets you jump to another file and continue CONFIG.SYS processing there.

DR DOS also has enhanced editing capabilities, both on the command line and in the system-supplied editor. If you include "HISTORY=ON" in CONFIG.SYS, DR DOS will let you edit command lines using WordStar key combinations. It will also let you retrieve commands you issued earlier and reuse or edit them in the command line. We discovered that HISTORY may also work within applications (not just at the DOS command prompt) as long as those programs use the standard DOS calls to read keyboard commands.

The Touch command, usually found in program's toolkits, sets a file's time stamp to the current date and time. This feature is handy for creating file audit trails.

DR DOS does not include Edlin, which may cause compatibility problems for people who rely on it for batch files. However, EMM386.SYS is not a powerful editor. Typing "editor" brings up a small

outside the 640K normally reserved for DOS.

DR DOS can place TSRs and drivers into an Upper Memory Block (UMB) between 640K and 1 megabyte, and it can load itself into either a UMB or the High Memory Area (HMA), just above 1 megabyte.

TSRs and drivers are loaded into high memory by placing one of two device drivers in your CONFIG.SYS file: HIMEM.SYS or EMM386.SYS. HIMEM.SYS can be used with other memory managers or with 8088 or 80286 systems. It does not support expanded memory.

EMM386.SYS supports the 80386 and 486 virtual mode and provides LIM EMS expanded memory emulation. However, EMM386.SYS is not as powerful as Quarterdeck's QEMM or Qualitas' 386 Max. For example, EMM386.SYS will only work with Windows in real mode; it does not support Windows' standard or enhanced modes.

With DR DOS and its drivers loaded above 640K, you will have plenty of memory for large DOS applications — as

icons and pull-down menus, and it allows you to select applications or execute commands using either the keyboard or a mouse. It has a strong (and not coincidental) resemblance to GEM, Digital Research's graphical environment. Both ViewMax and GEM use the same icons, windows, and graphics symbols.

Within ViewMax, applications and data files appear as icons in the same window. You can launch an application by clicking either on a document or on the application itself (once you have set up an association between a data file and its parent application). If you click on a document, its name is passed to the application so that you can start work on that document right away.

DR DOS and ViewMax earns a good score for user interface.

#### SPEED:

We tested DR DOS with the same applications-based test suite used for evaluating CPUs. Using a 12-MHz AST Bravo 386 and a Compaq Deskpro 386/25 at our test beds, we compared the throughput speed of MS-DOS 3.3, MS-DOS 4.01, Compaq DOS 3.31, and DR DOS. These tests consist of real-world tasks using dBase III Plus, dBase IV, Lotus 1-2-3 2.2, 1-2-3 3.0, WordPerfect 5.0, AutoCAD 10, and Paradox 386. We also ran a multitasking test under Windows.

On the 12-MHz AST, DR DOS' CPU speed was a bit slower than MS-DOS 3.3, but faster than MS-DOS 4.01. Both versions of MS-DOS had faster disk-intensive and multitasking throughput than DR DOS.

Running on the 25-MHz Compaq, DR DOS' CPU speed was slightly slower than MS-DOS 3.3 and Compaq DOS 3.31, but slightly faster than MS-DOS 4.01. DR DOS' disk speed was slower than Compaq DOS or MS-DOS 4.01 and faster than MS-DOS 3.3. In our multitasking test, DR DOS had the slowest throughput. We rate its speed good.

#### COMPATIBILITY:

We had no problems running common business applications — including Microsoft Windows — under DR DOS.

DR DOS jumps through a few hoops to be compatible with MS-DOS. We

## REPORT CARD INFO WORLD

### SINGLE-TASKING OPERATING SYSTEM

#### DR DOS

VERSION 5.0

Criterion	(Weighting)	Score
<b>Performance</b>		
Memory handling	(150)	Very Good
User interface	(75)	Good
Speed	(125)	Good
Compatibility	(150)	Excellent
Documentation	(50)	Good
Setup	(75)	Very Good
Ease of learning	(50)	Very Good
Ease of use	(100)	Good
Error handling	(25)	Satisfactory
Support		
Support policies	(50)	Good
Technical support	(75)	Good
Value	(75)	Very Good
Final score		7.2

### PRODUCT SUMMARY

**Company:** Digital Research Inc., 70 Garden Court, Box DRI, Monterey, CA 93942; (408) 647-6675, (800) 274-4091.

**List Price:** \$199; \$79 upgrade offer through August.

**Requires:** IBM PC XT, AT, PS/2, or compatible; 256K of RAM for DR DOS; 1 megabyte of RAM and CGA or higher display for ViewMax. Two floppy drives or one floppy drive and hard disk.

**Pros:** Impressive memory management capabilities; enhanced DOS commands; ViewMax graphical user interface; easy installation; on-line help.

**Cons:** On-line help is not extended to system error messages.

**Summary:** DR DOS is a strong competitor to Microsoft's MS-DOS 3.3 and 4.01. DR DOS offers a longer list of commands than MS-DOS does, fine compatibility with PC applications, and no loss of overall performance. Although DR DOS is a better value today, its future success will be determined by Microsoft's upcoming MS-DOS 5.0.

## MemoryMax allows TSRs, device drivers, and the operating system to be loaded outside the 640K normally reserved for DOS.

but powerful WordStar work-alike that is useful for editing small-to-moderate-size text files. We found it handy when experimenting with options in CONFIG.SYS and AUTOEXEC.BAT.

Another MS-DOS utility not found in DR DOS is DOS Debug. Instead, Digital Research has SID — a slightly more powerful debugger than Debug. (See "Missing: Debug Compatibility," Page 93, for a more detailed description of SID.)

#### MEMORY MANAGEMENT:

One of DR DOS' most important features is MemoryMax, a memory management system that allows TSRs, device drivers, and the operating system to be loaded

much as 620K. (You can get more with utilities such as Quarterdeck's VIDRAM, which expands the available space upward into the video memory region. However, if you use VIDRAM, you can't use graphics programs, including DR DOS' ViewMax.)

DR DOS' memory handling is very good.

#### USER INTERFACE:

DR DOS' standard format has the same spirit look and feel as MS-DOS, right down to the command-line prompt and drive letter.

ViewMax — DR DOS' graphical front end — is functionally equivalent to MS-DOS 4.01's graphics shell. ViewMax has

### APPLICATIONS TESTS

#### Operating Systems

(test times in hours:minutes:seconds)

	AST Bravo 286/12 DR DOS 5.0	MS-DOS 3.3	MS-DOS 4.01	Compaq Deskpro 386/25e DR DOS 5.0	Compaq DOS 3.31	MS-DOS 3.3	MS-DOS 4.01
<b>CPU-intensive</b>	1:45:47	1:45:03	1:47:45	0:31:28	0:30:24	0:30:27	0:31:30
<b>Disk-intensive</b>	1:33:04	1:29:48	1:24:13	0:45:36	0:44:28	0:45:49	0:44:05
<b>Multitasking (Windows)</b>	0:08:48	0:08:36	0:08:34	0:03:32	0:03:19	0:03:21	0:03:23
<b>AutoCAD, Release 10</b>	0:16:44	0:16:10	0:18:46	0:05:18	0:05:06	0:05:08	0:06:07
<b>dBase III Plus 1.1</b>	0:52:01	0:49:16	0:46:09	0:24:56	0:24:03	0:24:44	0:23:43
<b>dBase III Pro 1.0</b>	0:24:30	0:24:10	0:22:24	0:10:01	0:09:44	0:10:07	0:09:37
<b>Lotus 1-2-3, Release 2.2</b>	0:29:01	0:28:55	0:28:57	0:10:03	0:09:17	0:09:17	0:09:18
<b>Lotus 1-2-3, Release 3.0</b>	0:57:07	0:57:06	0:57:09	0:14:45	0:14:42	0:14:43	0:14:45
<b>Paradox 386</b>	0:16:33	0:16:22	0:15:40	0:10:39	0:10:41	0:10:58	0:10:45
<b>WordPerfect 5.0</b>	0:02:55	0:02:52	0:02:53	0:01:22	0:01:19	0:01:19	0:01:20

Our applications tests of common business programs tests different aspects of system performance, including video (AutoCAD), expanded memory (Lotus 1-2-3, Release 2.2), extended memory (Lotus 1-2-3, Release 3.0), and 32-bit operation (Paradox). If you plan to buy a machine for a specific application, you should compare times for that program. Lower numbers indicate better performance.

INFO  
WORLD

noticed that DR DOS hides its true identity from DOS applications. When you enter the VER command, the system displays "DR DOS 5.0." However, the internal function (30h) that tells applications the version number of DOS, reports version 3.31.

This white lie actually has some advantages. If you're upgrading from DOS 3.3 (by far the most popular version of MS-DOS), you won't have to install new network drivers for LANs, such as Novell's NetWare. (If you install MS-DOS or PC-DOS 4.01, you'll need to switch from Net3 to Net4.)

We rate compatibility excellent.

#### DOCUMENTATION:

DR DOS' documentation comprises two booklets: a users' guide and a ViewMax guide. Digital Research also includes a laminated quick-reference card. The users' guide was reasonably well organized and had an adequate number of examples (though we would like to have seen further examples for some of the more complicated commands). The perfect-bound users' guide tended to close when laid on a desktop. We rate documentation good.

#### SETUP:

DR DOS comes with a polished menu-driven install utility to guide you through the installation and setup process. The utility lets you automatically install DR DOS on a floppy disk, unformatted hard disk, or MS-DOS formatted hard disk. With each menu of installation options, the utility marks the default selection, which helps when you are unsure what to choose. There is also content-sensitive help for each option. You can also choose to automatically overwrite MS-DOS command files with the equivalent DR DOS files.

Although the installation is generally easy to use, we found some of the options confusing. For instance, one of the setup menus gives three options: Maximize application memory at the expense of functionality, Balance application memory and functionality, or Maximize performance and functionality at the expense of application memory. It was not clear from the installation menu what kind of setup each possible answer would produce. Overall, however, we rate ease of setup very good.

#### EASE OF LEARNING:

Because Digital Research's operating system has the same look and feel as MS-DOS, experienced PC users will have no difficulty learning DR DOS. This operating system also promotes ease of learning by providing ViewMax for those who want to use it on-line help for those

who prefer the command line. The most significant improvement we would like to see would be on-line help for internal commands (which are by far the most used) as well as the less frequently used external commands. Ease of learning rates very good.

#### EASE OF USE:

DR DOS rates better than standard MS-DOS in this category due to the ViewMax graphic shell and the command-line history facility. The new and enhanced commands also make it faster to copy, view, and delete files than in MS-DOS. We rate DR DOS good in ease of use.

#### ERROR HANDLING:

DR DOS' error messages are different from those in MS-DOS. The messages are still terse, and users may have to refer to the manual for definitions. (This is another area that's ripe for an on-line help facility.) Overall, we didn't see much improvement over MS-DOS. We rate error handling satisfactory.

#### SUPPORT:

**Support policies:** Digital Research supplies unlimited free technical support during business hours, Pacific time, but the lines are not toll free. (Microsoft, in comparison, has a 900 number.) DRI also offers a 60-day money-back guarantee. We rate support policies good.

**Technical support:** Of the four calls made to Digital Research's technical support (scattered throughout the business day), we averaged 8 minutes on hold before connecting with a technician. The technicians were knowledgeable and answered some relatively tough questions promptly. We rate technical support good.

#### VALUE:

DR DOS has a list price of \$199. Through August of this year, there is a \$79 upgrade special from any version of MS- or DR DOS to DR DOS 5.0.

DR DOS takes MS-DOS' solid foundation and adds more functions and better ease of use. Although Version 5.0 could still use refinement, DR DOS is a big improvement over existing products. The long-term value of DR DOS 5.0 depends on what Microsoft puts into its next release of DOS. For now, we rate DR DOS' value very good. □

Brett Glass was one of the original architects of the IEEE 802.5 Token Ring LAN, and currently hosts the OS/2 conference on The Well. He can be reached electronically at [7267.3673] on CompuServe, "glass" on BIX, and rogue@well.sf.ca.us on Usenet and the ARPA Internet.

## Missing: Debug Compatibility

We found only one incompatibility in DR DOS: It does not have the DOS debug utility. Instead, DR DOS comes with a modernized CP/M debugger called Symbolic Instruction Debugger (SID).

Although SID is slightly more powerful than DOS Debug, added capability is not what most users need. Because many SID commands are quite different from DOS Debug's, it's not possible to use DOS Debug scripts — files published in books, magazines, and on BBSes — to enter programs in hexadecimal format. You can modify DOS scripts to work with SID, but the process is beyond the knowledge of most users.

Unfortunately, even if you have a copy of DEBUG.COM from PC-DOS or MS-DOS 3.3, it won't run under DR DOS because of the difference in version numbers. We found only two ways to get DOS Debug working under DR DOS: Borrow it from Compaq DOS 3.31, or patch DOS 3.3's Debug to look for Version 3.31 instead.

# IBM Hits the Ground Running With Clever 486SX-Based PC

Intel CPU provides slower, lower cost alternative to full-power 486 machines.

BY TIM ZITTEL TEST CENTER  
AND ANNE KALICZAK  
ASSOCIATE REVIEWS EDITOR

IBM has stolen Compaq's traditional thunder by being first to release a personal computer based on a new Intel CPU. IBM's 486SX-based computer is a lower cost alternative to a fully powered 486-based machine.

The 486SX chip offers nothing new in technology; it is basically a slower version of the 486DX without the built-in math coprocessor. In our tests, the 20-MHz 486SX-based computer was faster than a 25-MHz 386 machine, but much slower, as expected, than a 25-MHz 486 computer. (We will publish a product comparison of 486SX computers in the June 24 issue.)

Many vendors are announcing 486SX systems, and the chief attraction for buyers will be the low cost. (Intel's reasons for developing the chip include moving the market away from rival AMD's 386 clones.)

Overall, IBM's PS/2 Model 90 XP 486SX is a fine machine. It has a clever modular design and, like other IBM Model 90s, includes XGA video on the

motherboard.

We encountered an odd incompatibility with Lotus 1-2-3, Release 3.1. This particular version of 1-2-3 assumes that the 486 chip has a built-in coprocessor, and when it encounters the 486SX — a 486 without a math coprocessor — it hangs. Fortunately, it's simple to get around this problem by starting 1-2-3 with the command "123-3," which fools the program into thinking it is running on a 386 chip (See "Bug Found in 1-2-3, Release 3.1 Running on 486SX PCs," May 13, Page 5).

We didn't find any other incompatibilities in the course of testing, but we assume that any other programs that expect a math coprocessor when they see a 486 will have a similar problem.

We ran our standard benchmark test suite on the IBM Model 90 486SX. (See "How We Test," April 1, Page 53.) The IBM 486SX outperformed the IBM PS/2 Model 70 386/25 but was slower than the PS/2 Model 70 486/25 Power Platform in CPU-intensive operations. However, in disk-intensive tests the 486SX was the clear winner over both the IBM 486 and 386 systems, thanks to the 512K of cache

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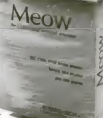
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IBM's PS/2 Model 90 486SX combines high-quality workmanship, speed, built-in XGA, SCSI, and upgrade options for less than a Model 70 486/25.

on the machine's SCSI disk controller.

We tested Windows performance in standard VGA mode and in XGA mode with IBM's included driver. XGA tested faster than VGA, and we base our score on the XGA results.

The IBM 486SX, like most PS/2s, employs the Micro Channel Architecture bus and comes standard with 4 megabytes of RAM, XGA video, and a SCSI adapter.

The system includes a modular processor card that can be easily replaced with a more powerful CPU. IBM currently offers an upgrade path to a 486/25 or 486/33, and a 487 SX-20 coprocessor option is slated to be available sometime in July.

The system contains four standard 32-bit Micro Channel slots, one with a video extension, and two proprietary memory slots and the CPU slot. After our configuration only three 32-bit slots were left free, but the system has the capability to support up to seven SCSI hard disk drives.

This system is very easy to set up. Attached thumb screws replace the easily lost case screws common in other systems. And there is even a special floppy drive removal tool that conveniently hangs on the interior wall of the system. CPU, memory, and coprocessor options reside on easy-to-change proprietary

cards, and there are no switches to find or chips to remove.

IBM traditionally offers support through the dealer channel and authorized entities for the length of the original warranty, after which they offer direct support based on a service contract. There is a service support line, 1-800-IBM-SERV, which is available 24 hours a day.

IBM is usually on the top of the price scale, and we found that with preliminary pricing information from other 486SX vendors, this is still the case. The 486SX system is priced at \$8,945, just \$395 less than a similarly configured IBM Model 70 B-21 486/25 Power Platform (which does not include XGA or SCSI capabilities) and \$1,505 more than the Model 70 386/25 A-21. (Street price for the 486SX unit might range from \$6,000 to \$6,700.) However, the Model 90 XP 486SX is a very well-thought-out system that delivers 486-class performance without a significant loss in other areas.

**TEST CENTER'S FIRST 486SX.** This review is the first to test the capabilities of any 486SX. We will provide an in-depth look at a number of 486SX machines in our June 24 evaluation; the scores reported in this review could change at that time due to the relative performance of other 486SX computers.

## REPORT CARD INFO WORLD

20-MHz 486SX MICRO CHANNEL COMPUTER

### IBM PS/2 Model 90 XP 486SX G99

Criterion (Weighting) Score

#### Performance

Speed —		
CPU-intensive	(150)	Good
Disk-intensive	(100)	Good
Multitasking	(125)	Good
Compatibility	(150)	Very Good
Minor snag with 1-2-3 3.1; one processing speed.		

Expandability	(75)	Good
Upgradable to 486/25 or 486/33; 32 megabytes RAM; supports seven SCSI drives.		

**Documentation** (50) Satisfactory  
Sparse quick-reference manual, index, and troubleshooting guide; includes system setup sheet and configuration disks.

**Setup** (75) Very Good  
Modular system; special tool included for disk drive removal.

#### Serviceability

System design (50) Very Good  
Small footprint; Micro Channel Architecture; patches on processor daughter board.

Support policies (50) Satisfactory

Technical support (75) Good  
Score based on reader survey.

**Value** (100) Satisfactory

**Final score** 8.3

## PRODUCT SUMMARY

**Company:** IBM Corp., Old Orchard Road, Armonk, NY 10604; (800) IBM-2468.

**List Price:** \$8,945 as configured; sold through dealer channels, authorized industry remarketers, and marketing representatives.

**Features:** 20-MHz 80486SX CPU; XGA adapter; built-in SCSI adapter; two serial, one parallel, one PS/2 mouse port; Intel 80487SX math coprocessor support; 194-watt power supply.

**Peripherals:** Enhanced keyboard.

**Storage and Memory:** 160-megabyte IBM hard disk with SCSI 1:1 controller and 256K of disk cache; 1.44-megabyte 3½-inch floppy drive; 4 megabytes of 70-nanosecond RAM (SIMMs on expandable daughterboards, 32 megabytes maximum); 8K of RAM cache on the 486SX chip.

**Pros:** Small footprint, low profile; simple disassembly; large SCSI storage options; built-in XGA.

**Cons:** Slim manual; patches on CPU daughter board.

**Summary:** The Model 90 XP 486SX is a solid performer. It is modular, easy to upgrade, and includes a wealth of storage options.

## REVIEW RESPONSES

### Color Hand-Held Scanners

Our CS-4096 Color Hand Scanner was not included in your April 29 product comparison of gray-scale and color hand-held scanners (Page 51).

I would like to point out to your readers that our product has been shipping since February 25. It requires Windows 3.0 and includes three Windows applications: Astral Picture Publisher Plus, a 24-bit image editor; ImagePrep, CPI's well-heeled file and color-to-gray-scale conversion utility; and Migraph CS-4096 Scanner Utility.

The first two software products cost \$990, with a street price of about \$650. The CS-4096 Color Scanner Bundle retails for \$895.

The Migraph color scanner interface implements several interrupts and 64 switch-selectable addresses in order to resolve conflicts with any other device using reserved or nonreserved addresses, including SCSI and bus/mouse interfaces.

Kevin Mitchell

President

Migraph Inc.

Federal Way, WA

### Next Ntipping

I have a small nit to pick with *InfoWorld* regarding its Nextstar review (May 6, Page 73). The statement, "The NextStep environment does not have TSRs or Desk Accessories" is not true. This is the same as saying that Unix doesn't have a DIR command because Unix calls it LS instead.

The idea of a TSR or a DA is to give the user access to some application from within some other application.

The only reason MS-DOS or Macintosh need TSRs or DAs is that they are fundamentally single-tasking systems. Any Unix system, such as the Nextstar, is a multitasking system, so it doesn't need TSRs or DAs. Any application is always available from within any other application.

It would be more accurate to say that all Nextstar applications are TSRs.

Lee Sailer

Kinzuld Inc.

Jameson, PA

### Professional Write Plus

Software Publishing Corp.'s Professional Write Plus (reviewed May 13, Page 87) is an extension of the Professional Write product line onto the Windows platform. Professional Write for DOS continues to be an important component of SPC's presence in the word processing arena.

Carolyn Karr

Software Publishing Corp.

Mountain View, CA

In the May 13 review of Professional Write Plus, we published an incorrect phone number. To reach Software Publishing Corp., dial (415) 962-8910.

— Editors

*InfoWorld* welcomes comments about its reviews. Letters are subject to editing for space and clarity. Please address correspondence to the Reviews Editor, *InfoWorld*, 1060 Marsh Road, Menlo Park, CA 94025.

## BENCHMARKS

### IBM PS/2 486, 386 Computers

	Model 90 XP 486SX	Model 70 <sup>1</sup> 386/25 A-21	Model 70-B21 <sup>1</sup> 486/25 Power Platform
Clock speed	20 MHz SX	25 MHz	25 MHz
CPU-intensive speed	23:06	24:35	14:09 <sup>2</sup>
Disk-intensive speed	40:49	55:20	51:42 <sup>2</sup>
Multitasking speed	02:38	2:42	N/A
Multitasking speed <sup>4</sup>	02:11	N/A	N/A

All times in minutes:seconds.

<sup>1</sup>Reviewed April 1, Page 45.

<sup>2</sup>Reviewed March 12, 1990, Page 49.

<sup>3</sup>These times reflect a former test plan. Numbers are for general comparison only.

<sup>4</sup>Multitasking score with the Windows XGA drivers loaded.

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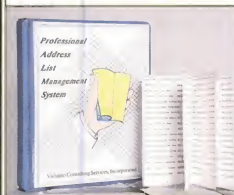
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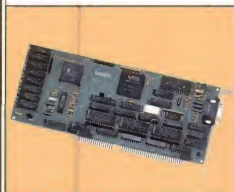
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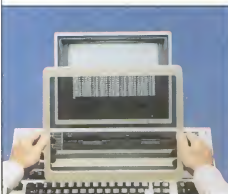
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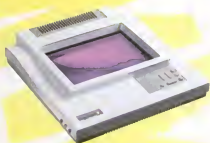


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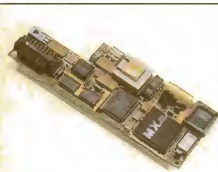


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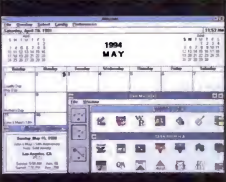
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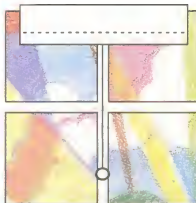
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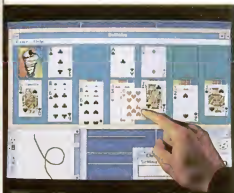
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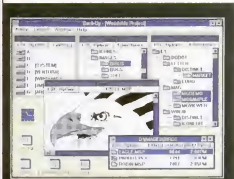
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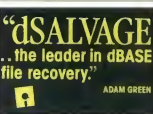
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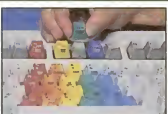
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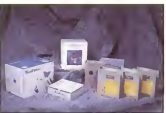


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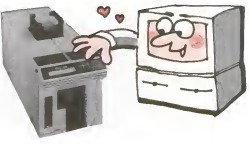
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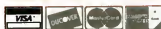
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<sup>1</sup>A caching disk controller reduces drive access time to 0.5ms (from 15ms). It also increases throughput by 200%, eliminating disk bottlenecks.

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## AD INDEX

3Com .....	48-49
Advanced Logic Research .....	116
Astrix Computer .....	110
Banyan Systems .....	26-27
Blackship Computer Systems .....	107
Borland .....	2
Central Point Software .....	17-20
Core .....	30
Corel .....	23
Delrina .....	25
Digital Equipment Corp. .....	61-63
Everex .....	85
Fifth Generation Systems .....	45
Gateway 2000 .....	78-79
Genstar Rental .....	44
Hewlett-Packard .....	10-11, 40, 82-83
IBM .....	12, 34-35
IDG Books .....	66
Informix .....	6, 9
Intel .....	38-39
Leading Edge .....	7
Lotus Word Processing .....	65
Micro Express .....	41
Microcom .....	4
Microcom Virex Division .....	42
Micrografx .....	22
Microsoft .....	14-15, 74-75
NBI .....	91
Nevada Computer .....	109
Northgate .....	51, 68-70
Novell .....	46-47
Okidata .....	32-33
PC Pros .....	108
Pacific Data Products .....	115
Racal Interlan .....	29
Robbins-Gioia .....	93
Seiko .....	36
Storage Dimensions .....	37
Symantec Corp. .....	21, 24, 54-59
Tandon .....	58-59
Texas Instruments .....	67
Traveling Software .....	16
Ventura Software .....	6

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ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; ARGENTINA'S EDUCATION; ARGENTINA'S HEALTH; ARGENTINA'S LAW; ARGENTINA'S MEDICINE; ARGENTINA'S POLITICAL SCIENCE; ARGENTINA'S SCIENCE; ARGENTINA'S SOCIAL SCIENCES; ARGENTINA'S SPORTS; ARGENTINA'S TECHNOLOGY; ARGENTINA'S TRANSPORTATION; ARGENTINA'S TOURISM; ARGENTINA'S RECREATION; 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## Multimedia

Continued From Page 1

touch input and includes a VGA monitor, an M-Motion audio board, and a laser disc player. The Information Delivery System is a 286-based computer with a VGA display, a CD ROM drive, and an 8-bit audio board.

IBM also expects to introduce in June a 39-inch, 128-megabyte magneto-optical drive. It will cost less than \$2,000, IBM officials said.

IBM's video digitizing board will display real-time, full-motion video in 16-bit color, and is expected to ship this year.

Like Microsoft's multimedia extensions to Windows, IBM's multimedia extensions to OS/2 will let users incorporate sound, animation, and video into applications. The extensions for Windows are due in June, and OS/2 extensions will ship this fall, Blakeney said.

## IBM

Continued From Page 1

IBM Credit Corp. IBM has effectively financed mainframe and other host systems over the years. But it has never offered such a program for PCs.

"This is responding to a complaint from users who say, 'You are giving me all this [OS/2] technology but no economical way of upgrading my 286 to it has never been offered,'" said Frank Drubeck, president of Communications Network Architects Inc., a Washington-based consulting firm.

The trade-in program will naturally propagate OS/2 2.0, one analyst said. The operating system will require an 80386SX or greater, and many 80286s have not been fully depreciated.

Along with the proposed trade-in plan, the company is also more seriously considering "pre-installing" OS/2 2.0 on certain 80386-based machines.

IBM has also developed a touch-sensitive display built into an 8515 monitor. Also in the works is a consumer-oriented multimedia CD ROM disc that contains 150 hours of sound, text, animation, and live video. It was codeveloped with Synapse Technology and is slated for release in October.

VoiceType, a voice recognition system based on Dragon Systems' Dragon Dictate was announced by IBM and Dragon last week. The character-based system will come with a headset into which users give spoken commands and dictation that are "understood" by the computer, and translated into the appropriate function or ASCII text. The system, which can be trained to individual users' speech, will cost \$3,185 when it ships in August.

"Eat your heart out, Bill Gates," Braun said, as an 8-year-old boy finished demonstrating LinkWay, one of IBM's authoring tools at a spring Comdex keynote address.

Guglielmi said. It gives IBM a way of adding value to its 80386s, he said.

Analysts and users generally had positive reactions to the plan, but its success depends on the discounts and specific implementations, they said.

"On paper it sounds good, but the problem is who is going to implement it and pay for it," said Mark Levitt, hardware analyst at International Data Corp., in Framingham, Massachusetts.

"The question is one of implementation and cost. If IBM takes the initiative, it might work. No one has succeeded in setting up trade-in programs because of those two issues," Levitt said.

IBM offered a trade-in plan through dealers in July 1988, that failed to generate much interest. (See related article, June 13, 1988.) That plan allowed users to trade in PC XTs and ATs for PS/2s at reduced prices. That plan, however, was aimed at much smaller users and did not involve the IBM Credit Corp.

## HP Positions NewWave as Ultimate Environment

By STUART J. JOHNSTON

ATLANTA — By putting NewWave on top of various operating systems, Hewlett-Packard Co. is positioning it as the end-user operating environment of the future, and the key to system independence, a company official said at Comdex last week.

"Over time, we're going to release Unix and OS/2 clients to complement the Windows client," said Webb McKinney, general manager of HP's cooperative computing object division.

"Our customers' world consists of Windows and DOS, and OS/2 Presentation Manager,

Macintosh, Unix, and proprietary operating systems," said McKinney whose division is responsible for NewWave. "To really solve the 'Information at Your Fingertips' problem, you have to have the software running across the whole network, because the information is everywhere."

McKinney said it's no one operating system is going to dominate — that, by the end of the decade, no one operating system will have more than 20 to 30 percent market share," McKinney said.

McKinney would not comment to delivery dates for OS/2 and Unix versions, but he said

HP's teams are targeting 1992 for the first releases. There is also "a chance" that HP will develop a version of NewWave on top of Apple's System 7.

"We haven't announced anything on the Mac yet, although frankly we're getting customer demand for that," McKinney said. "Some of our major customers are a lot of Macs and a lot of NewWave, and they're saying, 'We'd like this stuff to work together.'"

The multipatform strategy is directly related to HP's recent announcement with Sun Microsystems Inc. of an Object Request Broker (ORB) facility for Unix networks, McKinney said.

## Microsoft

Continued From Page 1

enson said. "Then they went off and did Windows 3.0 and left all these guys high and dry. So maybe these new tools are to [make Microsoft] look more like good guys to ISVs."

The statements on poring tools, which were made at Comdex here last week, come at a time when IBM is also distancing itself from Microsoft.

"On paper it sounds good, but the problem is who is going to implement it and pay for it," said Mark Levitt, hardware analyst at International Data Corp., in Framingham, Massachusetts.

## OS/2

Continued From Page 1

including future versions, according to Soyring.

"Under OS/2 2.0 users can boot DOS 3.3 in one of the virtual machines and boot, say, a DOS 8.0 in another, and all that code would be included in your license agreement [for OS/2 2.0]," Soyring said.

After extensive research among its customers to find out what they wanted most out of OS/2 2.0, the top priority was found to be compatibility with DOS applications, in which

some corporations have a substantial financial investment.

Soyring said he spent a lot of time with customers and their top priority is to run all DOS applications, which is why he wanted to develop a better DOS than DOS and priced it less than DOS," Soyring said.

Some applications benefit most from working under DR DOS 5.0, and IBM wants to assure users of those programs that they will have access to the DR-developed program, Soyring said.

DR has made it a priority to ensure smooth compatibility with OS/2 2.0, according to

[that] Lotus has found quite simple to use," he said.

Microsoft will also port strategic products of its own, including LAN Manager and SQL Server, to 32-bit Windows.

Microsoft will release a 32-bit API for Windows and OS/2 3.0, with the NT kernel, the company said in January.

The company has also described a concept it calls Advanced Windows, which would use NT's capability to run multiple xAPIs. Advanced Windows, however, would only feature Windows and DOS APIs, and not PM.

Dick Williams, president of the company.

"One of the things I have our people chartered on is providing full support of OS/2 [2.0] within our operating system," Williams said. "And I think IBM is focusing on providing full support as well in the other direction."

Many of the technical features in DR DOS 5.0 — including superior memory management above the 640K barrier giving users more room to run DOS applications — will appear in Microsoft Corp.'s DOS 5.0, which is expected to be announced June 11, sources said.

— Ed Scannell

## Gates Predicts Flood of Windows Apps

ATLANTA — Windows 3.0 sold 4 million copies in the last 12 months, and the rollout of Visual Basic will generate "10 times" as many new applications in the coming year as already exist, stated Microsoft's chairman Bill Gates.

"The only product that has ever sold at [Windows] rate has been DOS," Gates said at the Visual Basic announcement during the Windows World last week in Atlanta.

Sales of Windows applications grew by three times in the second half of 1990 to more than \$400 million, Gates said.

roduction of Windows applications by other major publishers will cause sales to more than double again.

Some end-users and ISVs, while generally optimistic about Windows 3.0's second year, did not completely agree with Gates' rosy outlook.

"I think [Gates] is right in saying [Visual Basic] will increase Windows applications by 10 times," said a software analyst responsible for implementing Windows for a major manufacturer.

Windows 3.1 will be out in the end of the year, Gates said.

— Stuart J. Johnston

## Apple

Continued From Page 1

Sebastopol, California.

"You're talking about moving to a new processor family. It would be no different from moving from the [Motorola] 68000 to Intel's products," Slater said.

Apple intends to build some Mac compatibility into the new Pink systems, sources said.

"Apple's going to have to let [Pink] run Mac software to get users and developers to go to this new machine," said one developer.

The planned operating sys-

tem for Pink is based on object-oriented programming tools and will consist of several modules. One such module is a portion of the Mac OS that will let users run their Mac applications, just as OS/2 has the DOS compatibility toolbox to run DOS programs, sources said.

Other portions of the new OS include an "interface builder" similar to that found in NextStep.

The company's new object-oriented programming division is playing a key role in developing the Pink family of products. The division was established to conduct research on technologies that will carry Apple through this decade and beyond.

Apple would not comment specifically on the Pink project. The company had established an object-oriented programming division when CEO Sculley was named head of Apple's research and development effort, Apple said.

Apple intends for the Pink family of high-end workstations to compete with systems from Compaq, Sun Microsystems, Next, and IBM, according to sources close to the company.

Last month Compaq joined the ACE Initiative, a group of vendors working on a new RISC platform based on the MIPS R4000 chip. Those systems are also expected to ship in the mid-1992 time frame.

# ALSO P'S FABLES ■ BY STEWART ALSOP

## Visual Basic Is Remarkable, Even to Nonprogrammers

My fellow columnist, Steve Gibson, ranted and raved last week about Microsoft's new Visual Basic and promised to continue ranting about it this week. Gibson knows what he's talking about when it comes to programming and said he has already written several programs of commercial quality using Visual Basic. I am not a programmer, didn't understand about a third of what Gibson wrote, and will remain forever committed to staying a normal user and human being. But I want to join Gibson and rant and rave, as well.

Even a normal human being can see that what Microsoft has managed to accomplish with Visual Basic is important and essential. Indeed, Visual Basic seems a fundamental step forward in the constant search for the best and most modern way to give users control over their computers. And it is, for Microsoft, the completion of a full circle started when Bill Gates and Paul Allen began programming a version of Basic for the MITS Altair back in 1975, sort of a repositioning of the intellectual leadership in the area that gave Microsoft its start as industry behemoth.

Here's the history of user programming in 1,000 words or less: Gates and Allen's original Basic (which was repossessed by Gates and named Microsoft's Basic) was so successful that it became de rigueur for any manufacturer of micro-

computers to include Basic in the ROM of the computer, regardless of the processor or operating system. In essence, Microsoft Basic allowed any computer user to write their own programs with a minimum of learning time or difficulty if they were bold enough.

An estimated 10 percent of people who bought PCs (perhaps higher in the early days) were bold enough. As a result, Basic launched a whole new generation of programmers who owed nothing to the "traditional" ways of programming. And that in turn led to an incredible outpouring of creativity and insight represented by the huge body of personal computer software, commercial and otherwise.

That model of including Basic in the ROM of the computer continued when IBM introduced the PC in 1981 and, therefore, became the standard that was cloned by every other manufacturer.

But during that time, Microsoft did little to move Basic forward as either a programming language or a model for user programming. And, in 1984, two things happened to take away Microsoft's leadership in the area: a "blindingly fast" Pascal, introduced by a crazy Frenchman, for the PC struck the fancy of the mainstream user programmers; and in the same year, Steve Jobs introduced the first machine to even not include Microsoft Basic — the Macintosh.

At the time, Basic had fallen very, very far behind other programming languages, perhaps because Microsoft was busy with

operating systems and applications, but most likely because of the limits imposed by burning the program into ROM. So programs written in Basic were scorned, and programmers that used it claimed only to be making prototypes. Borland's Turbo Pascal managed to outlast the Basic camp almost entirely, simply because it allowed the same people to write better software.

At the same time, the Macintosh introduced a new generation of users to a different model of computing that included no form of user programming whatsoever. That lack of built-in programming became a problem as users became increasingly restless over their inability to control and modify the Macintosh to suit their own purposes.

Eventually, in 1987, Apple responded to that need with a truly innovative program called HyperCard. HyperCard came with its own programming language packaged inside a visual metaphor of stacks of cards. The stacks could be designed with a built-in painting program and buttons placed upon them to run programs written in the built-in language.

Now Microsoft has taken back the intellectual leadership of this very important area by bringing the best of Turbo Pascal together with the best of HyperCard. The problem with Turbo Pascal is that it still a programming language and requires some period of training to write even the smallest program.

The problem with HyperCard is that it is not integrated with the Macintosh operating system and instead forces the user to open a new environment with different rules and appearance in order to run programs written in HyperTalk. (Apple is working on solving this problem with something called Applescript, but that effort took a back seat to shipping System 7. So Apple has decided to support an alternative scripting system called Frontier, from UserLand Software.)

Visual Basic solves both of these problems at once. It lets the user get started writing small programs simply by combining objects (programs that have already been written to do certain common tasks). But it does that within the usual environment of Windows so that the user ends up with a standard Windows program that can be launched and manipulated the same as any other Windows software.

According to people such as Gibson, who are supposed to know about these things, the way that you write Visual Basic programs is state of the art, and the performance of the resulting software is excellent.

So what Microsoft has managed to do is to create the perfect user programming environment — for the 1990s. Pretty good for a \$1.5 billion software company.

*Stewart Alsop is an industry analyst and editor of PC Letter, in Redwood City, California.*

## NOTES FROM THE FIELD ■ BY ROBERT X. CRINGLEY

### Brain Damage Sticks Intel 50-MHz 486 in Pipeline Until December

There's a theory that the Roman Empire was destroyed by indoor plumbing. Only the rich folks — the leaders — could afford to have water pumped into their houses through soft lead pipes, which eventually poisoned their brains. Christians vs. lions, fiddling while Rome burned, TopView — blame it all on the pipes.

That's what I was thinking about in the Coliseum-like Omnidome last week when the Booker T. Washington High School marching band and drum majorettes high-stepped into the spectacular, cast-of-thousands birthday party for Windows 3.0 in Atlanta. They were the best part of a week otherwise noteworthy for high humidity, bad Elvis and Marilyn Monroe imitators, and not much in the way of interesting products.

**POWER FAILURE.** "Come on, Bobby. Let's dance!" said Pammy, pulling me out on the Omnidome floor while undulating in a way that must be hard-coded in her DNA, because it sure couldn't be taught.

Pammy's dancing works. Intel's 50-MHz 486s don't, according to beta testers who are burning the chips out right and left. Yields on the chips are so bad that Intel has pulled the spec sheet back and doesn't plan full production before December. Right now only Compaq, HP, and IBM can get samples in any quantity. That's the true 50-MHz chip. Then there's the 25-MHz part that may not



offer much extra performance. It's a 25-MHz external/50-MHz internal part, so any instruction that takes an odd number of clocks — including the much touted 1 cycle RISC-like ones in the 486 — must wait one internal clock cycle before they can access the external world again.

And my theory that the 486SXes are chips that failed QA, turns out to be correct. There are 13 final tests a 486DX has to pass, and the 486SXes available right now are chips that passed only 12 of those tests, then had their CPUs disabled. On purpose 486SXes will show in December.

**BAD BET, STEVE.** The best-attended Comdex conference was "Tuning Windows for Optimum Performance," which was re-

peated by popular demand, proving that Win3 is both popular and immature.

And speaking of maturity, IBMers are talking about a note from Microsoft's Steve Ballmer to Tommy Steele, head of OS/2.2.0 development for Big Blue. Steve reportedly has offered to crawl down a corridor on his hands and knees and eat a dixie if OS/2 2.0 ships by October 1. Austin programmers are pumped by the idea and working their tails off, so I figure that Ballmer is secretly working for IBM.

**1-2-3/OREIDY 600F?** I'm from the elbows and shoulderblades school of dancing; it's the Amish influence, and embarrasses Pammy a lot.

Also self-doomed to incompatibility is Lotus, which promises a new version of 1-2-3/G this year. Imagine the demand. They're moving toward CUA compliance, whatever that means (semicompliance), and will not include the software bridge that gives compatibility with other Lotus apps for Windows and Mac.

And look for a new LotusWorks package in August. They'll call it LotusWorks 3, even though there is no LotusWorks 2. That's so people won't think that Microsoft Office 3 is newer.

**APPLE ENTERS PC Biz.** Music at the Windows bash (an InfoWorld coproduction I have to say or lose my job) was by Chicago. Apple'd never heard of them. Figures.

While she bopped, I rested with some folks who knew a lot about Apple, where one plan on the table to increase PC market penetration is a trade-in offer for Intel-based machines. Since IBM is planning its own 286 trade-in plan to promote OS/2, I'd say Africa and Eastern Europe are about to enter the PC age, circa 1984.

Meanwhile, Motorola reps delivering a batch of 88110 RISC chips to Cupertino recently ran into a crowd from MIPS in the Apple lobby. I'd say there is still no decision on which RISC processor Apple will go with.

And look for three Mac notebooks this year, including Apple-built 16-MHz 68020 and 68030 units coming in November. Both weigh 7 pounds, have 2 megs 'o RAM, 40MB hard disks, and cost \$4,000 to \$5,000. The Apple/Sony notebook coming in December will have a 16-MHz 68000, 2 megs, 40 meg hard disk, weigh 5.5 pounds, and cost about \$2,500.

We parted 'til dawn, and stayed at Comdex, too, until the bitter end. That's when the kids in the Pinnacle Micro booth started giving out \$7 T-shirts, drawing a crowd of 200 or so people who fought over the booty. Next year: Christians and lions?

No letters please; I offend all religions equally. But if you've got an industry secret, call me at (415) 329-3555. E-mail me at MCI:CRINGE, or fax me at (415) 326-0326.

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Designed with an emphasis on interoperable compatibility, the POWERPRO can provide up to 40 VAX MIPS of processing power as a single user workstation, a UNIX™ workgroup host, or a Banyan® VINES™ or Novell® Network server. A wide range of applications such as CAD/CAM, office automation, and manufacturing management can all benefit from the dual processing power, 17-MB of standard RAM, and up to 1-MB of high speed RAM cache found on most POWERPRO models.

## What if I don't need all that power today?

Simple. Choose one of the single processor VM models of the POWERPRO. With one 33-MHz 1486 processor, 5-MB of RAM, and 64-KB of external cache, VM models can provide you with precisely the type of power your business needs today at a price that's more than competitive with ordinary single processor systems. But, unlike ordinary single processor systems, the POWERPRO gives you the ability to Just Upgrade the CPU™ to dual processing in the future.

Manufacturer Model Name	ALR POWERPRO 486/33 VM 64	ALR POWERPRO 486/33 SMP 512	Compaq SYSTEMPRO 486/33
CPU	Single 33-MHz 1486	Single 33-MHz 1486	Single 33-MHz 1486
# of Processors	1	1	1
Max # of Processors	2	2	2
Bus Architecture	32-bit EISA	32-bit EISA	32-bit EISA
Memory Cache	64-KB	512-KB	512-KB
RAM Std	5-MB	17-MB	8-MB
Hard Drive	none	330-MB <18ms	240-MB <18ms
Expansion Slots	12	12	11
Price	\$7,495	\$14,495	\$16,999

With the POWERPRO's advanced modular system architecture, the choices you make today won't limit your options tomorrow.



## The ALR POWERPRO

### Mainframe Features/PC Pricing

Designed with the same type of technology found in \$100,000 mainframe systems, the POWERPRO is a performance leader among PCs. A mainframe-like read-and-write-back cache design provides greater data efficiency than the standard write-through architecture found on the SYSTEMPRO. Likewise, ALR's SCSI SDA (Software Disk Array), which is standard on many models, provides POWERPROs operating within the UNIX environment with the same type of data storage fault-tolerance and high speed disk performance found on mini and mainframe computers.

Simply put, the ALR POWERPRO offers you twice the computer for less money. To find out just how fair a deal it is, visit your favorite authorized ALR reseller, or call:

**1-800-BUY-POWR**

**ALR**  
Advanced Logic Research, Inc.

9401 Jeronimo,  
Irvine, CA 92718  
TEL: (714) 561-6770;  
FAX: (714) 561-9240

Available at these selected

Resellers:

ALA Data Center Converting Point 333 IBM 386/387

IBM 386/387

Prices and configurations subject to change without notice. Prices based on U.S. dollars. ALR is a registered trademark of Advanced Logic Research, Inc. ® This and other marks are trademarks of their respective owners. © 1991 by Advanced Logic Research, Inc.



# When there's only one LaserJet to go around...

It's a lesson you learned long ago — how to share with others. But unfortunately, no one ever informed you of the ways to share a LaserJet® printer.

## ...you learn how to share.

So now you've got several people in your office all vying for the rights to a single printer. What do you do? Learn to share with Pacific Connect™.

This printer sharing device for the HP LaserJet Series II, IID, III, and IIID is perfect for environments with several PCs and/or Macintoshes. Why spend money on multiple LaserJet or PostScript® printers when you can share one LaserJet with up to five PC and Macintosh users?

Pacific Connect slips conveniently into the optional I/O slot on a LaserJet printer. So it's easy to install and easy to use. No other LaserJet printer sharing device comes complete with all the cables, adapters and Macintosh support needed. Of course, for PostScript operation you'll need Pacific Data Products' award-winning PostScript language emulation cartridge, PacificPage™ and the additional printer memory needed for printing PostScript files.

As if each user were printing to his own printer, Pacific Connect eliminates the need for mechanical switch boxes or networking software. And print jobs are placed in the user-upgradeable buffer memory of 256k or 1.25 MB, and printed in the order that they are received.

If you'd like to learn how to share, let Pacific Data Products show you how. Contact your nearest dealer or Pacific Data Products at 9125 Rehco Road, San Diego, CA 92121, (619) 597-4615, FAX (619) 552-0889.

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DATA PRODUCTS

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**Red Cross Virus.** Ambulance randomly moves across bottom of display.



**Friday 13th Virus.** Alias "Black Friday." Erases programs when you try to run them.



**Disk Killer Virus.** Alias "Ogre." Causes unexpected formatting of your hard disk.



**Stoned Virus.** Alias "Hawaii." Data loss caused by damage to directory and FAT.



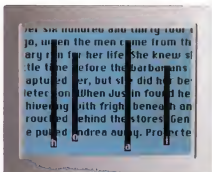
**Datacrime Virus.** Adds garbage to files and reformats disk.



**AirCop Virus.** Alias "Red State." Attacks boot sector on non-write-protected diskettes.



**Ping Pong Virus.** Alias "Bouncing Ball." Wipes characters off the screen.



**Falling Letters Virus.** Characters fall to the bottom of the monitor. Creative, but a real nuisance.



With over 50 new viruses each month, who knows what's next.

## You Could Get By Without An Anti-Virus Program. Then Again, So Could These.

These days, with networks, modems, laptops, and more and more people sharing files, it's only a matter of time before a virus attacks your data.

To make sure you get them before they get you, you need Central Point Anti-Virus.™ The only anti-virus program with File Immunization that protects your files so they can never be infected again.

Central Point Anti-Virus detects over 600 viruses and destroys twice as many viruses as other programs. It'll even protect you from unknown viruses by searching for suspicious behavior.

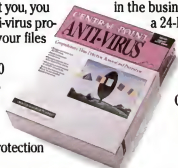
It's also the best anti-virus program for protection

inside Windows, and it works great across your Novell network.

And since there are about 50 new viruses popping up every month, we give you the most comprehensive support in the business. Including a free update, quarterly mailings, a 24-hour hotline with FaxBack, and BBS and Computer Serve support forums.

If you want the most complete virus protection, there are really only two things you can do. Call 1-800-445-4072 for more information. Or unplug your computer.

**Central Point Software, Inc.®**  
Making Computing Safer, Simpler, Faster.





## Personal Information Managers: Names and Notes At Your Fingertips

InfoWorld uses seven PIM programs to get organized. **See Page 65**

JUNE 3, 1991

FOR POWER BUYERS OF PC AND NETWORKING PRODUCTS

VOLUME 13, ISSUE 22

### Intel's 3-Chip Design for 50-MHz Systems

- Resolves performance bottlenecks when combined with the 50-MHz 486.
- Provides expandable RAM cache and cache controller tightly integrated with the CPU.
- Provides scalable performance, from full 50 MHz to 50/25.
- Speeds system design and implementation.
- Volume production expected in the fourth quarter. Stand-alone 50-MHz 486 also delayed till late 1991.

## Intel Delays Release of 50-MHz 486 Product Line Volume Shipments Pushed to Fourth Quarter

By Tom Quinlan

Intel Corp.'s 50-MHz 486 has hit a speed bump, with systems not expected to ship in volume until late this year.

According to sources familiar with Intel's plans, at least two versions of the 50-MHz chip will be introduced this year. The products include a stand-alone chip for use in systems that run at a full 50 MHz, and a three-chip product with an expandable RAM cache and a variable external speed.

Intel still intends to introduce at least the stand-alone 50-MHz 486 chip at PC Expo this month.

Several systems developers, including IBM, NCR, and Dell, are also expected to announce products using the chip the next day. However, production problems are expected to push back volume shipments of both the 50-MHz 486 and the three-chip implementation until the fourth quarter.

"What Intel is telling me is that there won't be volume shipment," says Intel, Page 109

## Akers Blasts Delays, Flaws in PS/2 Lineup

By Ed Scamell  
And Barbara Darrow

When IBM chairman John Akers recently lambasted his managers for the company's poor performance, he singled out supply shortages of the Personal System/2 that has caused its market share to drop.

"I'm sick and tired of visiting plants to hear nothing but great things about quality and cycle time — and then to visit cus-

tomers who tell me of problems. If people in the labs and plants miss deadlines, tell them their job is on the line too," Akers said in a memo obtained by InfoWorld last week.

Recent numbers indicate IBM's PC position has weakened. According to StoreBoard, IBM's units sales through resellers have slumped from 35 percent last June to 31.6 percent in December.

See Akers, Page 109

## Lotus Takes Third Swing at the Mac Release Fills Out Company's Cross-Platform Spreadsheet Strategy

By Barbara Darrow

Lotus will today announce the latest log of its cross-platform strategy for 1-2-3: a long-awaited spreadsheet for the Macintosh.

Historically, the Mac has been shaky ground for Lotus. The company announced the Jazz integrated package in 1985 and quickly discontinued it. Modern Jazz, an integrated package, was announced in 1988 but never shipped. And early this year, the company canceled plans to ship a CD ROM of direct marketing information called Lotus Marketplace: Households.

Officials of the Cambridge, Massachusetts, company swear

things will be different this time.

"This is a true Mac product — with things done the way Mac users like them," said Rob Adams, director of marketing for 1-2-3/Macintosh. A HyperCard-based help system, support for Mac System 7 features, and the spreadsheet's adherence to typical Mac conventions should appeal to even dyed-in-the-wool Mac users, he said.

Lotus has also included a software bridge that links 1-2-3 for the Mac to other versions of its cash-cow spreadsheet. The \$495 program will also translate Excel 2.2 macros and read files created with Excel 2.2 and 3.0, officials said.

The Mac version supports the same Classic Menu features

found in 1-2-3 for Windows. By pressing the slash key, Mac users can bring up a 1-2-3 menu, based on code from 1-2-3, Release 3.0. While the bridge in 1-2-3/W uses code from Release 3.1, the bridge brings macro compatibility between platforms, Adams said.

The product brings three-dimensional spreadsheets to the Mac and tightly integrates the graphics layer. "Our graphics are integral to the spreadsheet, whereas Excel's are pasted on top," Adams said.

Graphs on the worksheet automatically pick up legends and titles from the underlying spreadsheet.

"They've got very nice 3-D" See Lotus, Page 8

## Microsoft to Map Support for 3Com Users

By Jodi Mardeisch

### Microsoft Urges 3Com "Wizards" to Upgrade to LAN Manager 2.0

#### 3+ Share/3+ Open Upgrade to LAN Manager 2.0

Available now

From 1-5 user (Entry) to Server	\$595
From 10 user (Entry) to Server plus 10 pack	\$795
Unlimited 3+ Open or 3 Share to Server plus unlimited license	\$995

#### Macintosh Connectivity for 3Com Customers

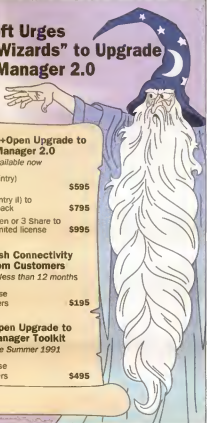
Available in less than 12 months

Server and license for unlimited users	\$195
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#### 3+/3+ Open Upgrade to LAN Manager Toolkit

Available Summer 1991

Server and license for unlimited users	\$495
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At a conference for 3Com network gurus today, 3Com Corp. and Microsoft Corp. will outline a revamped upgrade program designed to encourage users to stick with the LAN Manager platform.

The Wizard conference features Microsoft chairman Bill Gates as keynote speaker.

Under the program, 3+ Share and 3+ Open customers will have until at least the end of this year to get special prices on migration from the 3Com version of LAN Manager to Microsoft's LAN Manager 2.0, according to Ruth Warren, strategic marketing manager for Microsoft's network business unit. Upgrade prices range from \$395 to \$995.

When 3Com announced early this year that it was getting out of the network operating system business, users were uncertain whether to stick with LAN Manager. They looked at Novell NetWare and other options.

But these users now say they've decided to stay with LAN Manager. "We're planning on moving to LAN Manager," said one network manager at a large government installation. "We still don't see Novell as being strong in wide area net-

See Microsoft, Page 109